# Virginia Medical Monthly

**Official Publication of the Medical Society of Virginia**

Vol. 61, No. 6.
WHOLE No. 987.

RICHMOND, VA., SEPTEMBER, 1934

$2.00 A YEAR
25 CENTS A COPY


## MEDICAL PROGRESS

Some time ago the Editor submitted to several American internists this question: "What do you consider the three greatest achievements of medicine (as distinct from surgery and the specialties) during the past ten years?" The MONTHLY believes that its readers will be interested in the answers received:

1. A better knowledge of dietary deficiencies as exemplified most conspicuously in pernicious anemia;
2. The injection of toxin-antitoxin mixtures for the prevention of diphtheria;
3. A fuller knowledge of the function of the endocrine glands illustrated, for instance, by the precise diagnosis and successful operative treatment of certain disorders of the parathyroid and suprarenal glands.

—Louis Hamman, *Johns Hopkins University*, Baltimore, Md.

1. The discovery of liver treatment of pernicious anemia with its subsequent stimulation of the study of blood diseases;
2. The advances made in the treatment of pulmonary tuberculosis by surgical means;
3. The isolation of parathormones by Collip, and the subsequent stimulation of the investigation of internal glandular hormones.

—L. F. Warren, *Long Island College of Medicine*, Brooklyn, N. Y.

1. Insulin for the treatment of diabetes;
2. The use of liver in the treatment of anemia;
3. The discovery of Cortin, the hormones from the adrenal cortex.

—Walter W. Palmer, *College of Physicians and Surgeons*, New York, N. Y.

1. Discovery of the cure of pernicious anemia, together with the new field this work opens up;
2. Present-day knowledge of female sex hormonology;
3. Isolation of the adrenal cortex hormone.

—James H. Means, *Massachusetts General Hospital*, Boston, Mass.

1. The use of liver for the treatment of pernicious anemia is of basic importance, not only because of the therapeutic results, but because indirectly it leads to Castle's magnificent contribution concerning the mechanism of the production of this disease;
2. The rationalization of endocrinology and the very vast accumulation concerning the glands of internal secretion that have come from various laboratories.
3. The generalized use of toxoid in the prevention of diphtheria.

—J. H. Musser, *Tulane University*, New Orleans, La.

1. Insulin for diabetics;
2. Liver for pernicious anemia cases;
3. The use of proper vitamin diets in pellagra, especially the liver diet, will rank in time as the third great achievement.

—Frederic M. Hanes, *Duke University*, Durham, N. C.

1. The discovery of the cortical hormone of the adrenal gland by Kendall;
2. The use of liver in pernicious anemia by Minot and Murphy.
3. The discovery of the method of onset of granulocytopenia, the causes of the disease, and the large place that related leukopenias occupy in medicine.

—Stewart R. Roberts, Atlanta, Ga.

1. The work of Minot, Murphy, Castle and others on the relation of diet to Addison's anemia;
2. The work of Avery and his co-workers on the pneumococcus, particularly the study of the specific capsular carbohydrates;
3. The advances in knowledge of the glands of internal secretion such, for example, as the parathyroids. These advances have been brought about by many workers.

—C. Sidney Burwell, *Vanderbilt University*, Nashville, Tenn.

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# FACTS AND THEORIES OF ADRENAL FUNCTION.*

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Nearly a quarter of a century ago Cannon began a series of investigations on the adrenal glands which profoundly affected not only endocrinological research but developments throughout the field of physiology. Results which have accrued from his experiments have involved new concepts of cardiac activity and blood pressure, of carbohydrate and general bodily metabolism, of body temperature and the natural defenses of the organism, and more recently of autonomic nerve functions and the important mechanisms for bodily stabilization (Cannon).[1] It was perhaps not altogether unfortunate that the first brilliant experiments of Cannon on gastro-intestinal functions, begun about thirty-five years ago, should give place to research in the field of internal secretions and to adrenal investigations in particular.

*The Adrenal Medulla.* Certain fairly well-established facts with regard to the function of the adrenal medulla may be briefly mentioned. That the medullary tissue is not immediately essential to life is now well recognized. Animals appear to survive indefinitely following its removal, although not without evident functional disabilities. Some degree of compensatory restitution may eventually be established; the considerable importance of the medulla in the maintenance of normal bodily relationships nevertheless appears evident. It should be observed that sympathetic nerve impulses act perhaps invariably in conjunction with the adrenal medulla. While nervous action is probably initiatory in character, hormonal activity apparently tends to prolong and sustain the nervous influence.

In connection with the regulation of carbohydrate metabolism, particularly important functions are mediated through the agency of the adrenal medulla. Liberation of glucose by the liver is a notable and normal function of the medullo-adrenal hormone. It also appears that under at least some conditions, glycogen degradation in muscle is accelerated by adrenin discharge or the injection of adrenalin (Cori).[2] While a decrease in liver glycogen may thus be evident early in an experiment, there may later occur an augmentation, due apparently to hepatic formation of glycogen from lactic acid. The effects on circulatory activities need no elaboration; blood pressure and cardiac responses to extremely minute doses of adrenalin have been well demonstrated. An interesting case is the acceleration of the heart by one part of adrenalin in 1,400,000,000 of blood! (Anrep and Daly).[3]

Evidence also indicates that body temperature and tissue oxidations are greatly influenced by the supply of adrenin which is normally delivered to the blood stream. The chemical phase of body temperature regulation appears to be chiefly subserved, indeed, through medullo-adrenal activities. Cold is a very marked stimulant to adrenin secretion, and the calorigenic action of adrenalin has, of course, been long known.

*Sympathin: Emergency Theory.* Work of the past few years which has been carried out at Harvard indicates that excitation of the sympathetic system, which normally acts in co-operation with the adrenal medulla, releases a substance into the blood stream, which has been named "sympathin," apparently at the nerve endings in smooth muscle (Cannon and Rosenblueth).[4] This material acts apparently in a manner similar to the adrenal medullary secretion (although some exceptions have been noted), and the possibility of vicarious or compensatory reactions being mediated through sympathetic agencies can therefore be appreciated. It is worthy of note, however, that even the sympathetic system along with the adrenal medulla may be eliminated without bringing about death of the animal. The bodily exchanges in such a case show again many insufficiencies, particularly under conditions of emergency or stress.

The emergency theory of medullo-adrenal function proposed several years ago by Cannon has been supported by an overwhelming weight of evidence in recent years. The theory points out that in fear, rage and other emotional displays, the respiration

*Abstract of an address given at a meeting of the Richmond Academy of Medicine, April 24, 1934.

is increased, blood pressure rises and the heart beats more rapidly; gastro-intestinal activities are inhibited and blood is shunted to laboring muscles from the abdominal viscera, including the spleen; glucose is supplied to the blood from the hepatic glycogen reserves, and blood is also rendered more coagulable. These interwoven, protective reactions are brought about particularly, it has been established, through the medullo-adrenal mechanism acting in co-operation with sympathetic nerve discharges. From further work it appears that the adrenal medulla becomes operative and effective, indeed, in all conditions involving motion and emotion, at least in animals.

The older "tonus theory" of Elliott, discarded for many years, may perhaps be harmonized to some extent with the emergency theory. Reduction of arterial pressure, which is said to follow adrenal ligation, indicates that if adrenin is not actually continuously secreted, it is probably discharged into the blood stream with a rapid intermittency which approximates continuity, and thus tends to affect continuously the arterial pressure and other activities in the organism (see Cameron).[5]

Thus the adrenal medullary mechanism, in conjunction with sympathetic nerve impulses, besides sustaining and fortifying the individual in the contingencies of life, serves to maintain a "comfortable constancy" or "homeostasis" (Cannon) in the internal environment throughout the major period of the individual's routine existence.

*The Adrenal Cortex.* The problem of the function of the adrenal cortex has baffled the concerted attacks of investigators for many years. That such a very small amount of glandular tissue as is represented by the adrenal cortex—about 1/3000th of the body weight—should be so exceedingly vital to the organism scarcely seems credible. Poor operative technique was commonly blamed for the high mortality rates following adrenalectomy, but this can no longer be urged. There are many indications which appear shortly after the operation that animals subjected to complete adrenalectomy are doomed to early death, although the surgical procedures may have been blameless. Tested by condition and survival of the animal after operation, none of the smaller glandular tissues in the body can be considered so vitally important as the adrenal cortex.

*Adrenal Insufficiency.* Animals with obvious symptoms of adrenal insufficiency (muscular weakness and, later, convulsions) which usually appear five to seven days after adrenalectomy, show notable blood-chemical and other bodily changes. There is almost invariably a high blood urea and non-protein nitrogen, reduced serum sodium and chlorides and blood sugar, and an almost complete disappearance of liver glycogen. Blood pressure and circulating blood volume are usually low, and correlatively the blood is concentrated and the red cell count is much increased. There are reductions in the white cell counts, however, and comparison of the condition to "agranulocytosis" has been recently made (Corey and Britton).[6]

Although many workers have stated that the adrenalectomized animal becomes markedly dehydrated, this appears true only as regards the blood; liver and muscle tissues particularly are hydrated, and the operated animal as a whole appears to contain, indeed, more water than normal. Pathological lesions in the gastro-intestinal tract, pancreas and other tissues, which are found at autopsy, have not been shown to have any specific significance.

It is undoubtedly true that adrenalectomized animals die from loss of cortical and not medullary tissues. Medullo-adrenalectomy is not fatal, but death is said to result from cortical removal alone. Adrenalin administered to dying adrenalectomized animals brings about only temporary relief, probably by circulatory redistribution and augmentation of blood glucose. The cortico-adrenal hormone alone—without adrenalin—maintains completely adrenalectomized animals in apparently good health. It may be remarked that the evidence indicates, however, that the life-maintaining hormone is to be found in rather significant amount not only in the cortical but also in the medullary tissues.

*Cortico-Adrenal Extracts.* Development within the past few years of potent cortico-adrenal extracts, by Swingle and Pfiffner, at Princeton,[7] and by Hartman, at Buffalo ("cortin"),[8] has remarkably stimulated investigations on the function of the adrenal cortex. The preparations are made up in aqueous solution following (usually) alcoholic, acetone or ether extraction. There is no doubt that these extracts contain the hormone essential to life; completely adrenalectomized animals may be kept alive indefinitely when suitable doses are employed,

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starting with rather large amounts immediately after operation. Their action in cases of adrenal insufficiency is not as rapid but otherwise equally as striking as, for example, glucose injections on insulin hypoglycemia.

The convulsions of adrenal insufficiency (in rats, cats and other animals) disappear in fifteen to twenty minutes after extract injection, and in an hour or so an animal may sit up and take food. The material is effective not only by all the ordinary routes of injection, but also when given by mouth in three to five times the subcutaneous dosage (Britton, Flippin and Silvette).[9] The oral route has proved particularly effective in young animals, in which recovery from convulsions to normal in less than an hour after administration of the extract has been observed. A "dog unit" has been used by Swingle and Pfiffner. In our hands the potency of a batch of extract has been much more simply tested on operated cats, or on completely adrenalectomized young rats, either by the growth method or by restoration from severe adrenal insufficiency.

Extracts are now being made in many countries throughout the world, although in numerous cases the substances which are prepared are obviously of low potency and sometimes toxic because of phenolic decomposition products of adrenalin and other contaminating materials. The methods of extraction are still expensive, and long and difficult.

*Theories of Cortical Function.* Investigation of the problem of cortico-adrenal function has been given a new impetus with the development of effective extracts. Recently the attention of a wide group of investigators has been given to a determination of the physiological action of these preparations. Whether the results indicate the action of the hormone itself is a matter of conjecture, but one may recall in this connection that insulin has not yet been chemically isolated. Several years ago the theory was put forward from this laboratory (Britton)[10] that the adrenal cortex was probably chiefly concerned in the normal organism in the regulation of carbohydrate metabolism. Conditions observed in the completely adrenalectomized animal—the exhaustion of liver glycogen, low muscle glycogen, marked hypoglycemia and convulsions similar to those following insulin injection—now indicate that carbohydrate insufficiencies play a major rôle in bringing about death after adrenal removal.

In the case of no post-operative condition which involves the carbohydrate-regulating mechanisms of the body, e. g., in pancreatectomy or in hepatectomy, does the animal die with more profound indications of carbohydrate disturbance. Many tests carried out on adrenalectomized animals show indeed that carbohydrate metabolism is profoundly and probably primarily affected because of cortical removal. The effects of the extract on adrenalectomized and on normal animals, i. e., on blood sugar and liver and muscle glycogen, support furthermore the carbohydrate theory of cortico-adrenal function.

The theory proposed by the Princeton workers that cortico-adrenal function is concerned chiefly in blood-volume regulation is not tenable according to recent results, although the suggestion that salt and water metabolism is controlled by the cortex has some evidence in its favor. Changes in tissue and serum sodium and chloride observed by us in adrenalectomized animals are, however, not incompatible with life; they have, in fact, been produced to a similar extent in other experimental conditions without apparent detriment to the animal (Silvette and Britton).[12] This contrasts with the observation that the carbohydrate deficiencies which supervene after adrenal ablation are in themselves fully sufficient to produce death. Hartman's theory that the adrenal cortex produces a general tissue hormone has, it may be said, recently received some support.

That cortico-adrenal extract is able to bring about a marked increase in energy output by contracting muscle or in working animals, e. g., the dog may run five or ten miles or more than 100 per cent farther than normal under its influence, appears to have been well proved (Hartman *et al.*,[13] Eagle *et al.*[14]). Beneficial effects of the extract on fatigue and in other conditions involving muscular function will undoubtedly be shown in later investigations.

*The Adrenal Cortex and Sex Functions.* The possibility of the involvement of the adrenal cortex in sexual activities, early suggested by clinical investigations but put forward three years ago (Corey and Britton)[15] on an experimental basis, is now being very vigorously debated. A brief review of the literature has recently been published.[16] Young rats under cortico-adrenal extract treatment have been shown to reach sexual maturity in twenty-five to thirty days, compared to a normal maturation age of approximately 100 days for this animal. Com-

plete adrenalectomy in animals results in a suppression of the estrous cycle; ready restoration of normal estrus is brought about, however, by the injection of cortico-adrenal extract in small doses.[16] Later experiments indicate that pregnancy cannot continue normally in the absence of the adrenal cortex. Completely adrenalectomized animals may nevertheless survive through the gestation period and show normal parturition and lactation under the influence of cortical extract.[17]

The results tend to indicate, therefore, that two hormones are elaborated by the adrenal cortex, and apparently are present in the relatively crude extracts which are now used. The more important may be considered to be the life-maintaining hormone, of proven efficacy in adrenal insufficiency; the second may be designated the sex-stimulating or estrogenic hormone, concerning which further results are keenly awaited.

*Clinical Considerations.* Mention only in brief need be made at this time of clinical conditions. Addison's disease has been shown to be comparable in many of its expressions to the condition of adrenal insufficiency observed in experimental animals. The muscular weakness, low blood pressure and body temperature, gastro-intestinal symptoms, reduced blood sugar and blood serum and chlorides, and high blood urea and non-protein nitrogen are found in both experimental and clinical conditions. Although pigmentation has not been definitely evident in animal investigations, it is significant that the signs and symptoms are approximately the same in other respects.

Regarding the treatment of Addison's disease with cortical extract, perhaps the most that can be said is that the outlook is promising. Good results have already been reported from many countries to date. The extract is obviously alleviatory, but can scarcely be expected to prove of curative value except possibly in selected cases. The usual presence in this condition of a serious infective disturbance, tuberculosis, involving both adrenal cortex and medulla, offers obvious difficulties in treatment. The Muirhead regime, which includes the use of adrenalin, appears basically rational; the glucose administrations which form a part of the treatment may also be considered physiologically correct. Furthermore, large amounts of sodium chloride have recently proved highly beneficial in Addisonian cases. The effective treatment of this condition awaits, however, further fundamental work in physiology and biochemistry.

Hypertension has been related to adrenal hyperactivity for many years past. That sub-total adrenalectomy, involving destruction of two-thirds of each gland, should be carried out for essential hypertension scarcely seems justified. In a recent report by DeCourcy *et al.*,[18] the results achieved do not seem convincing. There appears to be no evidence that high blood pressure is related to overfunction of the adrenal cortex; rather, it may be postulated that the medullo-adrenal and sympathetic mechanisms, because of frequent and exaggerated functional displays, are responsible for essential hypertensive conditions.

It is possible that hyperthyroidism involves in a great many cases hyperfunction of the adrenal medulla. The unstable emotional condition, the hyperglycemia and glycosuria which are commonly associated with this condition, are rather strongly indicative of heightened medullo-adrenal as well as sympathetic activity.

Physiologists and biochemists in this and other countries are feverishly working towards the development of purified preparations of the adrenal cortex. Several investigators have announced that crystalline products have been obtained. Among them, Kendall[19] reported recently an empirical formula for the hormone—$C_{20}H_{30}O_5$; this worker also stated that he is now engaged in synthesizing the substance. It is not daring prophecy to venture the opinion that within only a few years potent preparations made from the adrenal cortex will be introduced generally into the field of medicine, and that these substances will markedly affect the care and treatment of widely-varying disease processes.

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## THE MANAGEMENT OF CROSS-EYES IN CHILDREN—ILLUSTRATED WITH LANTERN SLIDES.*

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Cross-eyes in a child is not only disfiguring, but also detrimental to the eyesight and future well-being of the child. A child whose eyes are crossed has an odd facial expression which may be termed a stupid or a dumb expression. As the child grows older, he becomes self-conscious of his affliction, his playmates call him "cross-eyes," "cock-eyed," or similar names. He soon develops an inferiority complex, shuns the contacts of other children and prefers to play alone, which is abnormal. Aside from his appearance, there is a more serious condition developing in the cross-eye. He is using only one eye in order to see. The cross-eye is idle as far as use is concerned. Because of non-use its retina and its visual nerve centers in the brain fail to develop during that important developmental period of life, which is from birth to six years of age. If it is neglected during that early developmental age this cross-eyed child is doomed to go through life with but one useful eye, which is a marked economic and social handicap to him. In these times of modern progress and keen competition, employers are hiring only physically perfect men. A boy with only one useful eye is put to a decided disadvantage. There are many physical defects which cannot be remedied, but at the same time there are some which can be markedly improved if treated early and properly. These few certainly should not be neglected.

*Read before the sixty-fourth annual meeting of the Medical Society of Virginia, at Lynchburg, October 24-26, 1933.

Cross-eyes is a condition which usually can be corrected if treatment is begun as soon as the condition is discovered, no matter how young the child may be. As physicians and medical advisers to the public, it should be our duty to advise the public intelligently. Do not tell the parents that

Before Operation. After Operation.

Fig. 1.

Note marked internal squint of right eye before operation. The facial expression is entirely changed after operation. A recession of both internal recti muscles was done.

the child will outgrow cross-eyes, but advise them to see a competent ophthalmologist and allow him to give advice. Valuable time is lost while waiting for a child to outgrow cross-eyes. Waiting may result in a permanent loss of vision in one eye. No one would intentionally cause a child to lose

the sight of an eye. Let none of us be guilty of such a thing unintentionally by failing to give proper advice.

Before Operation. After Operation.

Fig. 2.

Note marked internal squint of left eye which was entirely corrected by operation improving the facial expression of the child. Recession of both internal recti muscles was done.

In order to treat cross-eyes properly the ophthalmologist must have the whole-hearted co-operation of the parent and child. The progress is often slow and treatment may extend over a period of many months. The parents receive a superabundance of free advice from neighbors and friends. They become discouraged and often appeal to the family physician in whom they have profound confidence. It is at this time that he can be of great assistance by encouraging the parents, and co-operating with the ophthalmologist.

When the case is first seen, a definite prognosis cannot be given or the course of treatment outlined until certain very careful and exact examinations are made:

1. The vision in each eye must be determined as accurately as possible. This may be accomplished by the use of one of the several types of illiterate vision charts.

2. The presence or absence of paralysis of any of the extra-ocular muscles must be observed. This is important because the paralytic type is difficult and unsatisfactory to treat. Only the management of the non-paralytic type will be discussed in this paper.

3. The degree and the type of squint must be determined. It is most important in the operative treatment to know whether the cross-eyes are due to over-activity of the internal recti muscles, or to under-activity of the external recti muscles.

4. The amount of refractive error in each eye must be carefully measured under complete atropine cycloplegia. Atropine drops should be used for at least three days. It is often necessary to check the findings a second time. The prescribing of correct glasses depends upon one's accuracy in retinoscopy.

5. The duration of the squint and the age of the patient must be considered. Should the squint be of long standing, the chances of correcting it by means of glasses are lessened. In patients past the age of six years, the chances of improving vision in the squinting eye are poor.

Before Operation. After Operation.

Fig. 3.

Note extremely odd facial expression which is entirely corrected after operation. Recession of both internal recti muscles was done.

In treating cross-eyes, there are three goals to reach: 1. Straight eyes. 2. Normal vision in each eye. 3. Binocular stereoscopic vision. These goals may be accomplished by two methods of treatment—the non-operative, and the operative. The non-operative method should always be used first. In cases of large refractive errors, much can be accomplished by wearing the full correction, together with muscle training. During this period, vision in the squinting eye can be improved by causing the patient to use the eye. This can be accomplished by covering the non-squinting eye at intervals, or by blurring the vision in the non-squinting eye by means of atropine. After four months of constant

wearing of glasses, should the eyes fail to become straight and remain straight at all times while wearing the glasses, operative measures should be attempted. If the squint is due to over-activity of the internal recti muscles, they should be weakened by recession. Should it be due to under-activity of the external recti muscles, they should be strengthened by some shortening operation—advancement, tucking, or resection.

A B

Fig. 4.

Note that eyes appear to be crossed in Fig. A. In Fig. B the eyes appear straight after narrowing the bridge of the nose by means of the fingers. This is a case of pseudo-squint whose visual axes are parallel but the aparent squint is due to a wide nasal bridge.

After the eyes have been straightened (the visual axes made parallel) by operative means, the vision in the originally squinting eye must be improved and fusion developed by careful and constant training over a period of months. Until the three goals have been attained, e. g., straight eyes, normal vision in each eye, and binocular stereoscopic vision, the squint in children under six years of age is not considered corrected.

## CONCLUSIONS

1. Cross-eyes are an economic and social handicap.

2. To correct cross-eyes in children, treatment must be finished by six years of age.

3. Non-operative treatment should be attempted no longer than four months should the eyes fail to become straight.

4. Operative treatment should be attempted no matter how young the patient may be if the non-operative treatment fails.

5. Cross-eyes in a child are not corrected until he has straight eyes, normal vision in each eye, and binocular stereoscopic vision.

## DISCUSSION

DR. H. S. HEDGES, Charlottesville: The doctor has made a very good presentation of a condition which we are constantly meeting and in the treatment of which the ophthalmologist has got to depend very largely upon the heartfelt cooperation of the family physician and the parent. Remember in all these squint cases, first, that binocular vision and fusion, upon which we so much depend, is developed during the first six or seven years of life. If you wait until after seven years of age, when an eye has been squinting, you will never be able to develop binocular vision. In fact, if you wait after the first six months or the first year, the fusion faculty is developing in that eye. If you hold the prism base out before that eye, you will notice that the eye is moving in, to get rid of the annoyance of double vision. It is important to get at the child early, before you lose the possibility of developing that fusion faculty.

Where there is a large refractive error you can often, by correcting that, get rid of the squint. The child will, of course, have to wear that glass the rest of its life. But if you can not correct it by a glass, you have to resort to operation. If you can correct by the use of glasses, I believe that is better.

As to handling your cases, it is hardly possible to begin too early, I believe. You can put a glass on a child two years of age without any trouble at all. In some of those little fellows I find a bifocal is a real advantage.

But what I want to emphasize is the importance of cooperation between the ophthalmologist and the home doctor, because it is going to be a long, tedious course of training. If you find the refraction will hold it, that is a real advantage. But if not, then will come a long course of stereoscopic training, and there you have to depend on the mother. First, you have to find out what vision the child has. We can not tell what the child sees. The illiterate test cards have not helped me much. The best thing I have found is a series of cards showing a boy, a girl, and a teddy bear, and a ball. Get the child to tell you what each is, and get him to tell you which has the ball. Stand up close to the child, and keep on until you are quite sure the child will intelligently tell you which figure is which. Gradually move away until the child evidently begins to guess. As soon as they begin to guess where the ball is, they have reached the limit of their visual acuity. Do that with both eyes. In that way you can get an idea of the visual acuity of even a small child.

In the later training we find the stereoscopic pictures are the best things to train the child. It takes a

world of patience and a great deal of time to train one; it will take months and months, and sometimes years and years.

The only thing in which I disagree with Dr. Pilcher is that I think he is going a little bit too fast when he says that operative measures should be attempted at the end of four months' wearing of glasses unless there has been improvement. You can hold the eye, and the operative procedure is so much easier if you can wait until they are a little older. The operation in a two-year-old baby is very much more difficult than in one even four years old, because of the difficulty of working in the inner canthus, and in the folds of the nictitating membrane there it is very hard to find the proper plane. Then the placing of those recession sutures in this little patient is very difficult. So, if we can, by training, feel satisfied that we are holding the condition of the eye, that the vision of the squinting eye is not going down, we prefer to wait longer than four months before interfering in these cases.

There are dozens of different ways of doing the operation, and one man's way is not another's. There is one thing I want to caution you against. Don't let any one do a simple tenotomy. That is not done so much now, but it was done some years ago. Then, instead of having an internal strabismus, they will have an external strabismus, which is many times worse. The laity have unfortunately gotten the idea that it is a very simple operation, but I do not know of anything around the eye that calls for greater skill or more accurate technique than the correction of a squint, and there is nothing more satisfactory when well done. You are taking a handicap from that child that would hamper it all its life. When it gets to school the children will pick on it as chickens do on a sick chicken, and it is a great handicap when it gets out in the world.

DR. R. H. COURTNEY, Richmond: Dr. Hedges has made the cosmetic side of this discussion very dramatic. At the same time, I should hate for us to leave with the idea that this is purely a cosmetic defect. Dr. Pilcher has so clearly shown that ophthalmologists are primarily concerned with developing two useful eyes. It is sometimes surprising that a general practitioner should be so very unconcerned, yet we all know how concerned they are about preserving both kidneys, although we know that two kidneys are superfluous. So are two eyes superfluous, but we are quite concerned with preserving the vision of both eyes. We should realize that operation does not dispense with the need of glasses. Even though we do operate on these children when quite young, we are still dealing with the same defective eyes, and after operation they have the same amount of hyperopia and, although they develop good vision, they have the same amount of eyestrain as before, and it is very necessary for them to wear glasses. If the operation alone corrected this, I think we should advise operation oftener, rather than put them through the vicissitudes of wearing glasses.

I think sometimes the general practitioner advises the family that these cross-eyes that follow the acute exanthemata of childhood, measles, whooping cough, etc., are caused by them. They also follow the Fourth of July. There is no *post hoc, propter hoc* reasoning applicable here. They come on frequently after these diseases because both are common in childhood.

DR. PILCHER, closing the discussion: I think we should start treatment in these children when the squint is first discovered. If you wait until after six or seven years of age, as Dr. Courtney has said, they will have only one good eye.

In speaking of family physician's advice, I wish to call your attention to a case which we saw a short time ago. This child came into the office and we advised that it be operated upon, as we had gotten no improvement with glasses. The parents went to a doctor in their community for advice. He said: "No, don't have an operation; you never get any result; no squint has ever been cured by operation; they only get worse." Now, that statement is entirely false and without grounds. Squints can be cured by operation, as is shown by the pictures which I have projected upon the screen. If operated upon early so that the eyes are straight, the child will have two good eyes instead of one.

## ABDOMINAL SURGERY IN CHILDREN.*

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The surgeon who operates upon infants and children must approach his task with a pediatric attitude of mind. Some surgeons with wide experience in the adult field fail to recognize that "a child is not a little man," a fact which a former teacher of mine, John Lovett Morse, constantly emphasized in his classes. In a recent issue of the *Journal of Pediatrics,* Herbert E. Coe, of Seattle, calls attention to the necessity of recognizing that the treatment of surgical conditions in children is not merely

*Read before the sixty-fourth annual meeting of the Medical Society of Virginia, at Lynchburg, October 24-26, 1933.

an adjustment of surgical principles and technic to a small scale. That the child cannot be treated as a small adult is further emphasized by Thomas Myers, of St. Paul, who points out significant anatomical and physiological differences which the children's surgeon must weigh carefully if he would be cognizant of the narrow limits of safety in pediatric surgery.

Increased and unstable metabolism in children incidental to normal growth renders them more liable to a violent reaction from slight cause and makes disease sudden in onset and intense in symptoms. Moreover, symptoms are not limited to any particular region as in adults. The younger the child the more apt is the disease to manifest itself in generalized constitutional expressions rather than in focal signs and symptoms. Myers states that infants require much more water per pound of body weight than adults, that loss of 10 per cent body fluids is grave and 20 per cent usually fatal. Surgical shock is easily caused and hemorrhage poorly borne, because the proportion of blood to body weight in a child is 1 to 20 as compared to 1 to 13 in an adult. Hence, narrower margins of safety in surgery of infants and children demand special attention and preparation. Pediatric surgery must be gentle, rapid and skilful.

As I have pointed out in a previous paper, "Acute Appendicitis in Children," presented before the Richmond Pediatric Society, in 1931, "in infants and children the abdomen is normally large in proportion to the whole body and appears more so because of the small size of the pelvis and thorax. The abdomen contains not only the organs found in the adult, but also the bladder and upper end of the rectum. At birth the liver is proportionately very large, being about one-eighth of the whole body weight as compared to one-thirty-sixth in the adult. The size of the abdomen in infants and children is due to this large liver and to the presence of the bladder and rectum which have not sufficient room in the small pelvis.

"The colon occupies somewhat the same position that it does in the adult. During infancy the cecum may not have rotated and taken its position to the right side of the abdomen. The sigmoid with its long mesentery, instead of occupying its usual adult position in the left hypogastrium, may lie transversely in the suprapubic region or over to the right near the cecum, or it may hang down in the pelvis and give rise to a variety of partial fecal impactions.

"Except for the subcutaneous fat, the abdominal walls are very thin. The omentum in infants and young children is small in size, filmy in consistency, and does not give the usual protection against irritation and inflammation found in adults.

"The umbilicus is placed relatively low. In the newborn it is approximately at the central point of the whole figure."

The five most common pediatric conditions requiring laparotomy are acute appendicitis, gastrointestinal obstructions (intussusception, congenital pyloric stenosis), injuries, congenital malformations (hernias, diverticula, etc.) and tumors.

An accurate diagnosis, so essential to successful treatment, is particularly difficult in infants and young children. Digestive symptoms accompany most of their diseases, and the "upset stomach" is often found to precede or accompany some acute infection entirely outside of the abdomen. In the acute abdominal conditions the time element is usually very important, and the delay of a few hours may mean the difference between a prolonged, stormy convalescence or death and a normal recovery with a short, smooth convalescence. Furthermore, in children a favorable outcome of a surgical operation depends greatly upon a good general condition and a proper state of nutrition.

Except in cases of grave emergencies, a careful history should be taken before the examination is made so as to be able to direct the examination and delay causing pain with its accompanying crying, a factor so detrimental to a satisfactory abdominal examination. Misstatements and inaccuracies of the parent or nurse, either through ignorance, excitement or intention, must be carefully considered. In acute intestinal intussusception the history may often be more important than the physical and laboratory examinations. Opportunity should be taken, while obtaining the history, to gain the interest and friendship of the child. Much valuable information can be obtained at this time by careful inspection of the child's expression, movements and positions, such as flexed thighs in peritonitis, lateral position in empyema, characteristic labored breathing, facial expression with dilatation of ala nasi, in an early pneumonia.

The physical examination should be thorough, including especially the eyes, ears, mouth, throat, chest, glandular systems, abdomen, and last, but by no means least, a gently performed digital rectal examination. That part of the examination which is most likely to make the child cry should be postponed to the last, as it is almost impossible to examine satisfactorily a crying, rebellious child. Abdominal examination under a general anesthetic is sometimes indicated.

X-ray examinations are of the greatest value in children. However, an opaque meal or enema should not be done on any patient suspected of having an acute or even subacute appendicitis or peritonitis, as the presence of the barium in the gastro-intestinal tract and the necessary trauma of manipulation and handling for fluoroscopic examination will tend to spread the inflammation or even rupture an acutely inflamed appendix.

Considerable aid in differential diagnosis can often be obtained by laboratory examinations. A total and differential leucocyte count should be done. However, the value of a single observation, particularly if the total white count is about normal, may lead to a false interpretation. When it is possible to perform a Schilling's differential count, this should by all means be done. If properly carried out, it will show inflammatory changes much sooner than ordinary methods. Too much stress cannot be placed upon the accuracy and experience of the person making this test. Examination of the urine should be made. By urinalysis, complicating factors, such as diabetes, nephritis, and pyelitis can be determined. The findings of blood or pus in the urine do not necessarily mean a primary genito-urinary disease, as the presence of inflammation close to the pelvis of the kidney, ureter, or bladder may result in both pus cells and red blood cells in the urine.

The following three case reports illustrate many of the points which this paper attempts to bring out:

*Case* 1. Baby Virginia K. E., five months of age, was admitted to St. Elizabeth's Hospital in a stuporous condition in August, 1927. The family history and past history were irrelevant. The baby had been taken sick five days before admission. She had not vomited nor had she seemed seriously ill, but had a slight fever. The family physician was called and examined her. No treatment was advised except that she should be kept as quiet as possible and given large quantities of water. On the following day the baby was no better, and at that time the family physician prescribed calomel, to be followed by caster oil. The baby passed streaks of blood, became somewhat stuporous, but did not vomit. When the family physician again saw her, he did a rectal examination and felt a sausage-shaped mass which he thought was in the sigmoid. He made a diagnosis of intussusception and brought the patient immediately to the hospital for operation.

Examination showed a well-nourished, moderately dehydrated, stuporous baby girl. Abdominal examination, while somewhat unsatisfactory, revealed an indefinite mass in the left side. By rectal examination a mass was palpated which felt like a normal cervix uteri just within the anal sphincter. Attempts to reduce it by gentle pressure with the finger were unsuccessful. The rest of the physical examination was negative. The hemoglobin was 78 per cent by the Sahli method, w.b.c. 12,600; differential count 57 per cent neutrophiles, 43 per cent lymphocytes; blood smear not unusual. A diagnosis of intussusception with intestinal obstruction was made and immediate operation advised.

The baby was given ethylene-oxygen anesthesia. As soon as relaxation was obtained, rectal examination was repeated, and a further gentle attempt to reduce the intussusception with the finger proved unsuccessful. A medium-size rectal tube was inserted and warm soapsuds solution was injected with about two feet of gravity pressure. This did not change the position or condition of the intussusception. The simpler non-operative measures of reducing intussusception having failed, a low left rectus incision was made. Upon opening the peritoneal cavity, there was noted an increase in free peritoneal fluid which was blood-tinged. A large intussusception was found extending well down into the rectum, involving the entire colon, appendix, and terminal ileum. This was reduced as far back as the ascending cecum by gentle manipulation. Here the reduction was difficult and had to be performed slowly, as there was a great deal of edema in this region. The circulation of the ileum and colon returned satisfactorily after the intussusception was reduced. The appendix, bruised, edematous, and showing areas of early gangrene, was re-

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moved. A 00 plain catgut suture was used in the peritoneal and serous layers of the cecum in the region of the ileo-cecal valve, and extending on to the ileum for a distance of about 2 cm. The suture was then reversed parallel to the original suture line and tied. This was done in order to form a dense longitudinal adhesion and to prevent a recurrence of intussusception at the point where the intussusception had originally started. Towards the latter part of the operation, the baby showed evidence of surgical shock. The anesthesia was discontinued and immediately prior to tying the through-and-through silk-worm-gut sutures in the abdominal wall, 120 c.c. of warm, normal saline solution was injected into the peritoneal cavity. The entire operation lasted thirty minutes.

The baby's condition gradually improved. She took water by mouth in small quantities, at frequent intervals, beginning immediately after the operation. Two hours after operation she began to expel gas by bowel, and five hours after operation she took two ounces of breast milk. From that time on, she made a satisfactory and smooth convalescence. The wound healed by primary union, and the patient was discharged from the hospital, well, thirteen days after admission.

### COMMENT

This baby presented the typical signs of acute intestinal obstruction due to a very extensive intussusception. The symptoms, however, were not typical in that the patient did not vomit. The danger of giving cathartics for vague abdominal conditions is well illustrated in this case. The calomel followed by the castor oil, in all probability, increased the intussusception and produced enough irritation to prevent its reduction except by abdominal operation. Likewise, the value of rectal examination in the diagnosis of *all* abdominal conditions in infants cannot be over-emphasized.

*Case* 2. Master William S., six years of age, was playing with a large pane of glass which broke and stabbed him in the epigastrium. There was only slight bleeding. The child, however, began vomiting gastric contents which did not contain blood. The family physician saw the child within an hour, and his first impression was that there was only a small superficial laceration in the epigastric region. After the wound was disinfected a probe was passed with ease to a depth of two or three inches. Due to this finding, the physician brought the boy immediately to St. Elizabeth's Hospital.

Upon admission, about two hours after the injury, examination showed a mild degree of shock with subnormal temperature, pulse 160, and respiration 36. A jagged punctured wound in the mid-epigastric region, about three-fourth cm. in diameter, was noted. Surrounding this wound was a definite bulging of the abdominal wall for an area of 3-4 cm. in diameter. Moderate general rigidity of the abdominal muscles, especially in the upper half of the abdomen, was also observed. A leucocytosis was present (w.b.c. 14,000). No urine was obtained before the operation which was performed immediately.

Under ethylene-ether anesthesia, the wound was thoroughly disinfected and a probe passed easily into it for a distance of 4 cm. An upper right rectus incision was made about 10 cm. in length, and the skin perforation excised. The muscles and fascia were torn and bruised, and there was a rent in the peritoneum about 1½ cm. in length. Just beneath the peritoneal tear was a corresponding punctured wound through the lower portion of the right lobe of the liver behind which was a small (1 cm.) punched-out perforation in the upper anterior surface of the stomach. Through the gastric wound gas and gastric contents were escaping. There was only a moderate amount of bleeding from these injured areas and a limited early peritonitis. Careful search revealed no glass or other foreign material and no injury to the posterior wall of the stomach or other adjacent structures. The bleeding liver wound was closed with loosely applied interrupted mattress sutures of plain catgut. The gastric wound was sutured securely with two layers of 00 tanned catgut. A cigarette drain was placed between the liver and stomach just to the right of the sutured areas and the abdominal wound closed. The drain was completely removed in forty-eight hours; the wound healed without infection or delay; and the boy left the hospital sixteen days after operation, having had an uneventful, smooth convalescence. This patient has been followed at intervals for six years and has had no further trouble relative to his accident or operation.

### COMMENT

The importance of carefully examining a seemingly minor wound is well illustrated in the case of this six-year-old patient. Prompt recognition of a serious surgical condition with immediate surgical operation was the chief factor in the smooth convalescence and complete recovery from an injury where a few hours' delay would have been fatal.

*Case* 3. Baby Barbara E. D., age eight months, was admitted to St. Elizabeth's Hospital, April 2, 1932, with a diagnosis by the family physician of acute appendicitis with probable abscess. The baby was two months premature and weighed only six pounds at birth, labor having been induced in the seventh month on account of a serious kidney complication in the mother. The baby nursed from the breast for the first four weeks, then was put on a formula of diluted cow's milk. A few weeks before admission to the hospital she had begun to take pureed vegetables. She usually had difficulty with digestion and occasionally vomited. For about two weeks prior to admission she had had a mild digestive upset. One week before admission she vomited at irregular intervals. The stools were more frequent than normal and showed evidence of poor digestion and fermentation.

On questioning the mother and grandmother it was found that there was a definite history of slight distention, the baby assuming a dorsal position with both thighs flexed on the abdomen, for a few days prior to admission to the hospital. During the present illness the symptoms simulated very closely those which had previously been due only to digestive upsets. Since the formula and feedings had been changed just prior to that time and there existed no definite signs of any intra-abdominal disease, the diagnosis in this case was quite difficult. The family physician stated that for two or three days preceding admission there appeared to be some tenderness over the region of the appendix. The morning before admission the rectal temperature was 102, the baby seemed quite sick, and the w.b.c. was 28,000. The baby's doctor made a diagnosis of acute appendicitis with probable abscess and sent the baby to the hospital for confirmation of the diagnosis and operation.

On admission the baby appeared very sick, with a rectal temperature of 102.5, pulse 176, and periodic colicky pains. The abdomen was distended. She assumed a dorsal position with both thighs flexed on the abdomen and a particularly marked flexion of the right thigh. Extension of either thigh produced increased pain and crying. The abdomen was tympanitic throughout except for a fairly large area in the right lower quadrant. Bimanual rectal examination revealed an indurated, irregular mass and fullness in the right lower quadrant of the abdomen. On account of the unusual history and age of the little patient, a pediatrician was called in consultation to rule out any systemic disease or trouble with the chest. His examination revealed a fairly well-developed, but anemic looking infant. Eyes, ear-drums, nose, throat, heart and lungs were entirely negative. His examination of the abdomen corresponded with mine. The blood examination showed hemoglobin 50 per cent by the Tallquist method, r.b.c. 2,664,000, w.b.c. 27,800, with 76 per cent neutrophiles, and a Schilling's differential blood count with a shift of 75 per cent to the left. Urine specimen could not be obtained before operation without undue delay. A diagnosis was made of acute ruptured gangrenous appendicitis with abscess, and immediate operation performed.

Under rectal avertin basal anesthesia, supplemented by "open ether," a high McBurney incision was made and, upon opening the peritoneal cavity, slightly cloudy, bloody peritoneal fluid was expressed under pressure. The appendix was found near the midline, just below the umbilicus, adherent to a mass attached to the anterior abdominal wall and corresponding to the mass previously felt by rectal examination. This mass was an abscess and contained about two ounces of foul, thick yellowish pus. The pus was aspirated with the suction apparatus. The appendix was gently freed from adhesions and delivered into the wound. It was markedly congested throughout and in the proximal portion was a large gangrenous area where rupture had occurred. The appendix was removed and drainage tubes inserted. The ether anesthesia lasted ten minutes, and the entire operation about twenty-five minutes. At the close of the operation, 175 c.c. of normal salt solution was given subcutaneously. The convalescence was quite stormy for the first ten days after operation. The baby then began to improve rapidly and was discharged from the hos-

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pital on the twentieth post-operative day in good general condition, with the wound healed except for a small area where the drainage tubes had been placed. The baby's progress has been followed at intervals since her discharge eighteen months ago. She has gotten along satisfactorily in all respects.

## COMMENT

Acute appendicitis in infants before the age of two years is quite rare, and on account of the usual delay in making the diagnosis the mortality rate is great. The difficulty of diagnosis is very well represented in this case, and the successful outcome is due primarily to the keen observation and judgment of the family physician.

## CONCLUSION

Successful results of surgery in infants and children are largely dependent upon prompt recognition of the surgical condition by the general practitioner or pediatrician and his appreciation of the importance of the appropriate treatment at the most favorable time. Too much stress cannot be laid upon the necessity for complete medical and surgical cooperation in pediatrics.

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## DISCUSSION

DR. WM. B. MCILWAINE, Petersburg: Dr. Horsley has given us a very timely paper. He has brought out very definitely, I think, in his paper, the differences between the adult and the child from the physiological and pathological and anatomical points of view, and I feel sure that all the surgeons in Virginia realize these points. That means that I think the surgical profession as a whole realize at present that operations on a child are slightly different from operations on an adult, due to those things which Dr. Horsley brought out.

In Dr. Horsley's first case, the one of intussusception, which is always an acute affair in infants, and which generally happens anywhere from the sixth to the ninth month, in my experience, the following things have been of the most value in diagnosing the case. The first thing, I would say, that strikes you is that the patient is in shock; the patient is dull and stuporous. That leads you, naturally, not to consider the case lightly, but to go into the examination very thoroughly. In observing the baby, we almost always find rhythmic pains, rhythmic intestinal pains, unless the case has gone so far that there is no intestinal rhythm at all. The third thing is that you almost always feel a mass in the rectum. With these things in mind, even though there is no vomiting and occasionally no blood in the stool except after examination, I think you will be justified in doing an operation. Personally, I have had no success with the non-surgical method of reducing intussusception.

One thing Dr. Horsley did not bring out is the method of differentiating ruptured visci from small injuries. In one case I had, a child fell in the street and struck its abdomen against the curb. After six hours, diagnoses was made of ruptured spleen. Immediate operation was done. Spleen was removed and child made uneventful recovery. In another case, a child was running to get out of a rain storm and ran into a man who was also running to get out of the rain. Several hours after, the child was diagnosed as having a ruptured viscus. We thought it was a rupture of the intestine, which it proved to be. Immediate operation was done, and the child made an uneventful recovery.

In children, prompt recognition and prompt surgical interference are the mainstays in preventing disaster. Time is the most important element in these conditions.

DR. HAWES CAMPBELL, Enfield: While sitting here and thinking over the previous paper read by Dr. Coleman and this one by Dr. Horsley, this thought came into

my mind. What a debt of gratitude the public owes these people for utilizing their grey matter and studying out to the minutest detail these questions.

Coming down to Dr. Horsley's, it makes me think of some experiences in my thirty-six years of practice. One is the power of the press, the educational value of the newspaper; and I think that we are failing, in a way, not to let the public know what we medical men are doing and how we are laboring to save their children.

The next phase is this, that in treating a child, or anybody else, the private physician, the pediatrist, and the surgeon should cooperate.

The next thought that comes to me is the difference in diagnosis and treatment twenty-five years ago and today—the change, the wonderful improvement.

DR. J. BOLLING JONES, Petersburg: Dr. Horsley's paper was very timely. I want to tell you of two near accidents, one recent and one some years ago. I saw a child, a little boy, who was taken suddenly in the night with pain in the abdomen. When I got to him this little fellow was nearly frantic with pain. He had all the ear-marks of acute appendicitis.

In a child the history can not be gotten directly. In an adult the history can be gotten from the patient himself, and I do not want the wife to give me the history about the husband, nor do I want the husband to give me the history of the wife. With a child you have to get it from the mother. Therefore, we are lacking in that one point in dealing with children, because the history is indirect. In this little boy's case I took the history from the mother, and I thought it was acute appendicitis. I went home, six miles, and sent my technician back to do a blood count. The white count was up in the thousands. In the meantime, I told the mother to save a specimen of urine. It showed albumen and pus in clumps. When I got back out there, instead of finding an acute appendix, I found an acute gonorrhea in a little boy. As soon as I went to investigate the genital organs of the child, there it was.

Not longer ago than Sunday I was asked to see a child eight years old; the mother telephoned three times within an hour. She herself thought it was appendicitis. I went out there, and there was a little boy. Dr. Horsley made one point: he said the bladder in a child is an intra-abdominal organ, and he is right. When I got out there I saw the child's abdomen was enormously distended. He had been sick since Wednesday, and this was Sunday morning. I went over him and ordered the mother to give the child an enema and nothing by mouth. In going over him I could tell he had an enormously distended bladder. We all know that in acute appendicitis the patient will not void. I thought nature was protecting him. I did not want to operate on a dead child, so I thought I would get a confrere out there with me and in the meantime sent my technician out. The technician got a blood count of 22,000, with the polys in the nineties. I went out at twelve o'clock and, to my amazement, found the child perfectly comfortable. He did not look at all like the child I had seen at nine o'clock. He had absolutely no evidence of an intra-abdominal lesion anywhere. Still, the blood count was away up. I found a few marks on his chest, went over him, and what did I find? In the first place, he had scabies. In the second place, he had impetigo on his legs, and his hands were covered with pustules. Undoubtedly he had an acute dermatitis from that.

## THE CONSERVATIVE MANAGEMENT OF PELVIC INFECTIONS.*

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The treatment of pelvic inflammatory disease in the female at the present day is marked by a definite trend towards conservatism. I wish to outline the essential features of non-operative therapy as it has been employed in my hands during the past few years and to record the results therefrom. An exhaustive classification of pelvic infections is unnecessary. By far the majority of patients seen in practice suffer from the two common types, viz., gonorrhea and those post-abortive or puerperal infections, fulminating in character, marked by extreme persistency and usually associated with the streptococcus as a causative agent.

The treatment given to acute gonorrhea in its incipiency often determines whether the clinical course will be short or long and complicated. The application of irritating drugs, high-pressure douches, and the instrumentation of the cervix and urethra as formerly practiced undoubtedly led to a high incidence of adnexal disease. Absolute rest in bed, scrupulous avoidance of local instrumentation and of douches; the application of abdominal ice bags; the limitation of local therapy to vaginal instillations of mercurochrome or of tannic

*Read before the sixty-fourth annual meeting of the Medical Society of Virginia, at Lynchburg, October 24-26, 1933.

acid in glycerine as practiced by Curtis, will usually cause rapid subsidence of acute irritation in a relatively short time. For several years I have followed the technique of VonLackum, gently depositing a 4 gr. mercurochrome tablet against the cervix and placing a small cotton plug in the introitus with the patient in pronounced Trendelenberg position. The cotton is removed after several hours. Never is it packed tightly. Urethritis is treated by alkaline diuretics and balsamics, even the catheter being avoided as much as possible during this phase of the disease. The results of such a regimen have been gratifying and the incidence of development of andexitis has been almost nil.

In the presence of acute gonorrheal salpingocöphoritis the picture changes. For years a spirited argument centered around the question of early or late surgical intervention. The work of Simpson, Crossen, McMarrow, Curtis, Miller and others on a statistical basis led gradually to the present-day dictum "avoid surgery until the acute pelvis has cooled off." Fever should be absent for at least two weeks and not provoked by pelvic examination before surgery is undertaken. Adherence to these criteria has done much to lessen morbidity and mortality. Of course there are exceptional cases that will not subside under such a regiment. There are cases in which the appendix becomes involved, demanding its removal. Likewise, some patients present massive fluctuating abscesses which definitely point and reach such magnitude as to demand surgical drainage in order to prevent spontaneous rupture into a viscus or into the peritoneum. However, even here surgery is accompanied by increased risk, and the simplest procedure that will afford adequate external drainage with the minimum of trauma to the affected parts is imminently indicated.

Post-abortive and puerperal infections involve not only a more virulent organism but new pathways for its spread. The large blood spaces of the uterus resulting from pregnancy lead to engorged veins which quickly become the site of a septic phlebitis. This invites a spread of disease into the systemic circulation with consequent septicaemia, a matter of more serious import. Here we find the low lying infiltration of the parametrium with its characteristic brawny board-like induration. Recurrent chills and fever, indicating invasion of the blood stream, mark the clinical picture. Pain, while present, is likely to be less severe than in gonorrheal disease and often it is insignificant.

The treatment of hemorrhage and of retained fetal or placental parts in the septic uterus calls for meticulous judgment. Repeated transfusions will often take care of blood loss and allow time for disintegration and expulsion of the uterine contents. Should these measures fail, operative intervention should be limited to dilatation of the cervix and wiping out the uterine canal with gauze covered probes, using the utmost gentleness that the surgeon can command. Even these procedures are fraught with disastrous consequences and should be approached with an ultimate degree of reluctance. The septic uterus should be considered a "noli me tangere" of the greatest magnitude. Abscesses when definitely pointing in the cul-de-sac or broad ligament regions may be drained when fluctuation is massive and beyond question. Otherwise their absorption is allowed to proceed naturally regardless of the time factor. Operative surgery is streptococcic infection is hazardous even after long periods of time. Curtis advocates a rest period of at least two years subsequent to the acute process before any effort is made to remove residual masses. Streptococci live long and keep their potential virulence unimpaired in pelvic connective tissue.

Surgery being interdicted especially in the acute phases, how, then, may we manage pelvic inflammatory disease in order to reduce the infection to a minimum and save the pelvic organs from irreparable damage?

Conservative measures group themselves under the following headings:

1. Bed rest, Fowler position, maintenance of body fluids and of nutrition; in a word, supportive measures.
2. Abdominal ice packs.
3. Transfusions of whole blood.
4. Intravenous medication with especial reference to the use of mercurochrome, neoarsphenamine and the salts of calcium.
5. Intramuscular injections of foreign protein, such as boiled milk or the commercial defatted prolipin substances, such as proteolac, activin, etc.
6. The application of prolonged vaginal heat.
7. The treatment of the uterine cervix as a local focus for manitaining infection.

The application of most of these measures is familiar to every physician, so that a detailed account of their administration and their proper evaluation as therapeutic agencies is obviously superfluous. The abdominal ice pack is a time honored agency always to be applied. With spreading peritonitis, hot fomentations, kept at a proper temperature by electrical appliances, is perhaps a substitute worthy of trial.

The place of repeated blood transfusions, especially in puerperal infection, has been definitely established. In acute streptococcic infection in general no measure is of more value. While I use both the direct and indirect method at times, my preference for the direct transfusion of whole blood is decided.

As for intravenous chemotherapy, we may dismiss this controversial subject by saying that it has been disappointing. Yet, in the day when mercurochrome was more freely used, I have seen cases that showed a sharp favorable response to its administration. Neoarsphenamine is advocated in streptococcal infection and I believe worthy of trial. I have not used Rivanol.

Calcium chloride and gluconate by vein and by mouth, as advocated by Diasio, has, perhaps, relieved pain and in a few instances promoted resolution of the infectious process. The calcium ion depresses smooth muscle, relieves spasm, promotes active congestion and increases leucocytosis. However, I have not been impressed with its importance as a therapeutic agent in practice.

Almost routinely non-specific protein therapy has been used in gonorrheal cases. My impression is that it has some virtue, but I find it difficult to evaluate its status with any degree of exactitude. Certainly its application in well over one hundred cases has been attended with few if any dramatic results so far as prompt resolution of pelvic masses has been concerned.

Thus we find that the measures mentioned, with the exception of transfusion, act for the most part as adjuvants in therapy. At this point we find our chief weapons in combating pelvic infection to be building up the patient's resistance with prolonged rest and good hygiene. We now turn to two measures which, to some extent in acute disease and most certainly in the chronic type, have seemed to offer more direct evidence of their value in hastening the absorption of pelvic inflammatory exudates.

### PROLONGED APPLICATION OF VAGINAL HEAT

The vaginal application of heat in pelvic inflammation is of ancient origin. Hot douches, the vaginal introduction of heated shot, the use of antiphlogistine tampons, and in latter years the application of diathermy are to be mentioned. As regards diathermy, much was expected from the work of Corbus and O'Conor in which the excellent results following the application of their cervical thermophore and of body electrodes to the pelvic region were described. Good results are still reported but the method seems uncertain, expensive and requires meticulous care in application. On the whole it has never become popular. My own experience with diathermy in pelvic inflammation in women has been limited to the treatment of cervicitis. After a short series of cases I was not impressed by my results and the method was discontinued.

The use of the apparatus devised by Charles R. Elliott has been the subject of numerous articles during the past two years. The technique offers a new principle of applying prolonged dry heat to the cervix, vaginal vault and the bases of the broad ligaments. In the hands of Holden and Gurnee, of Gellhorne, Graham and Counseller, the results have been so satisfactory as to deserve meritorious appraisal. According to the Elliott technique, a distensible rubber balloon with a cleft for the cervix is introduced into the vaginal vault. Through an inflow and outflow tube hot water is circulated, the distention of the bag and the temperature of the water being maintained by an electrical machine, provided with a pressure pump, a suction apparatus, a heating device and a thermostat. During the usual hour of treatment the temperature of the water is raised from 110 to 130 degrees F. The labia are protected by folded towels as the skin and mucosa of the introitus tolerate a lesser degree of heat than the mucosa of the vagina itself.

The treatment is given daily over a variable period of time. Its application in all stages and degrees of gonorrheal and streptococcic infections, preoperatively and post-operatively, has been recorded with enthusiasm. Resolution of inflammatory masses, of pelvic indurations, of abscesses, of cervicitis, as well as the maintenance of patency of

the tubes, where plastic surgery has been attempted, is the rule.

Thus Holden and Gurnee report 5,233 treatments in 500 patients with excellent results in the great majority. Only 13 per cent of their patients with pelvic abscesses required colpotomy as against 75 per cent treated without the Elliott principle. Counseller recently reported the end-results in forty-three cases treated at the Mayo Clinic. In twenty-four non-surgical cases the result was excellent in 70 per cent, while nineteen cases treated surgically were uniform in satisfactory response, when the Elliott treatment was applied post-operatively.

One year ago I improvised another type of vaginal heater which has been applied with so much satisfaction that I am now attempting with the collaboration of an instrument maker its further development into a type of apparatus that will overcome some of its minor defects.

The apparatus as originally devised consists of an electric heating rod tightly fitted through one of the holes of a rubber stopper. Through a second perforation runs a metal tube, and through a third a thermometer. The metal tube is adapted to a glass syringe with rubber tubing. The heating rod is protected by a cover cut from a rubber bath sponge. The bag is made of a piece of two-inch Penrose drain doubly tied tightly at one end and inverted. This is drawn over the heating unit, inflow tube, and thermometer and is clamped tightly to the rubber stopper by means of a ring clamp carrying thumb screws for adjustment. (See illustrations.)

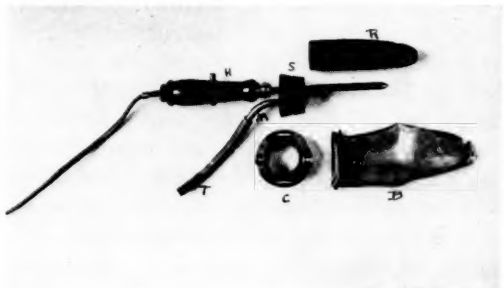


Fig. I.—Component parts of thermophore. H—heating unit. S—rubber stopper. M—metal inflow tube with rubber tubing. T. R.—conical porous rubber protector. B—distensible rubber bag. C—ring clamp with thumb screws and eyelets for tapes.

In applying the instrument, all air is aspirated and the rubber adapter tubing clamped. The vagina is wiped dry, the unit inserted gently to the cervix and the apparatus held in place with a T-binder. The rubber bag is filled with warm water, its distention being adjusted to the comfort of the patient. The inflow tube is then clamped off, the apparatus is connected to a light socket and the electric current turned on. The heat is gradually raised over a period of one hour to the tolerance of the individual. It should not exceed 130 degrees F. The current may be turned on or off by patient or nurse. Bulging of the bag at the introitus and possible burning is prevented by encircling the apparatus with a two or three-inch strip of gauze placed just distal to the stopper. A strip of adhesive is bound around this and a thin layer of dry lamb's wool is applied over the adhesive tape. The apparatus is allowed to remain in place one hour, when the current is disconnected. The bag is emptied of water, the apparatus removed, its parts dissembled and sterilized.

While this instrument in its present form is quite perfect, its application numerous times in thirty-two cases has convinced me of the value of the principle involved. In no case have we had burns of any consequence. The relief of pain, the production of profuse cervical discharge, and the resolution of pelvic induration have been striking and consistent in the clinical results. The indications for surgery have been lessened to such an extent that salpingectomy and similar procedures have rarely been required. The average number of treatments has been ten or twelve. In one instance we dealt with a protracted and neglected steptococcic infection associated with gynatresia, poor uterine drainage, and pyometra. Following a plastic vaginal operation and the release of cervico-vaginal adhesions, the heater has been applied over fifty times. However, this exceptional patient is now making satisfactory response and has almost no palpable pathologic changes in the adnexa. Four cases of post-abortive or puerperal infection have been somewhat slow in their response to treatment, but are greatly relieved and their pelvic induration is progressively subsiding. I feel that caution should be used in applying this type of treatment initially, especially in streptococcic disease. Any exacerbation should call for temporary cessation of the treatment, which is to be used again with more caution after the acute symptoms have subsided.

### ERADICATION OF CERVICAL INFECTION

Finally, I wish to consider the uterine cervix as a focus of infection both from a local and systemic standpoint. The endocervix with both acute and chronic inflammation, whether it be due to gonorrhea, to lacerations and infection incident to parturition, or even to the prolonged irritation of a pessary, readily becomes a stronghold for a variable bacterial flora, including streptococci, staphylococci, bacilli of the colon group, as well as the gonococcus. This focus draining into the pelvic lymph spaces offers a constant source of infection directly to the adnexa and pelvic lymph nodes. Curtis holds that gonorrheal tubes become free from gonococci in about two weeks after the subsidence of fever. Further exacerbations are due to reinfection from the cervix.

Fig. II.—Thermophore assembled for application.

Furthermore, the importance of the cervix as a systemic focus in such diseases as arthritis, endocarditis and nephritis is receiving more and more emphasis. The cervix has properly been called "the pelvic tonsil."

Again, the cicatricial changes incident to lacerations and to cervical infection itself not infrequently lead to stenosis with consequent poor uterine drainage, dysmenorrhea and adnexal pathologic change. For these reasons alone, leaving out of consideration the relation of endocervicitis to the development of cancer, the eradication of cervical infection in pelvic inflammatory disease becomes a matter of paramount importance.

The application of the cautery in various ways has been a time honored method of treating endocervicitis. Radial stroking of the portio vaginalis is usually advocated, but, in my hands, has not infrequently failed to cure the leucorrhea or infection. More rigorous deep cauterization, while destroying the nidus of infection in the cervical glands, is fraught with the danger of dense cicatrization such as follows any burn. Intractable stenosis ensues and makes the cure worse than the disease. Furthermore, the scarred cervix from cauterization dilates with difficulty, as is attested by the protests against the method from obstetricians who are impressed by the dystocia resulting from such a procedure. Again, scar tissue from cauterization is resilient and quickly contracts, reproducing stenosis. Hence the cautery should never be applied to the cervical canal in a woman of menstrual age. Textbooks on gynecology do not stress this point sufficiently. Cervical amputation and tracheloplastic procedures are less frequently followed by stenosis. Nevertheless they are associated with obstructive symptoms often enough to be contraindicated except under unusual circumstances in women before the menopause.

Fig. III.—Thermometer added to unit. This is placed outside the conical rubber protector so as not to come in contact with heating unit.

Electrosurgical coagulation and conical excision of the endocervix with the electric rotary wire loop knife introduced by Hyams, have been welcome innovations of which I can speak with praise. They have replaced the electric cautery in my own personal work. With the loop electrode knife, under infiltration anesthesia, using the technique of Greenhill, one can almost amputate the elongated cervix and cone out the endocervical glands as easily as one can apply the cautery. The procedure may readily be carried out in the office. Patients thus treated must be carefully watched over a period of three weeks for hemorrhage which occurs in variable degree with the separation of the thin coagulum. Douches and heat treatments are contraindicated during this period. The cervical canal should be

wiped out with a mild antiseptic every few days to remove gross sloughs or retained blood clots which may allow a moderate septic absorption. I have personally made a practice of passing a sound through the cervical canal at three and six weeks after operation. Usually at the end of six weeks the canal is entirely epithelialized. Such minor pelvic pain and parametrial induration as the patient may have as a consequence of treatment by this time has disappeared.

The cicatrix from electrosurgical endocervical excision is usually soft and much more pliable and distensible than that consequent to application of the cautery. Stenosis of any degree has been infrequent and dysmenorrhea after two or three periods has been the rare exception. In fact, a number of patients with obstructive dysmenorrhea have been relieved as a consequence of this type of therapy, when previous simple cervical dilatation had failed. My experience with electrical endocervical excision now includes more than fifty cases. They have responded with almost uniform satisfaction. Chronic adnexal disease seems to be favorably influenced by the procedure, and exacerbations after healing of the cervix have not been seen. One must emphasize, of course, that the procedure should not be carried out in the acute stages of pelvic infection whether this be in the cervix or in the adnexa. This follows the general principle that all operations on the cervix, regardless of type, are to be done only when pelvic disease is in a stage of distinct chronicity.

## CONCLUSIONS

The advantages of a conservative approach to dealing with pelvic inflammation have been reviewed. Aside from the drainage of large abscesses with massive fluctuation, the treatment of sharp hemorrhage and the removal of retained products of conception which may be occasionally forced upon us, surgery has no place in dealing with acute infectious pelvic disease.

In chronic inflammatory disease, the application of vaginal heat by the Elliott method or by the technique which I have described, the cautious surgical treatment of focal endocervicitis along with the establishment of good uterine drainage, will lead in a high percentage of cases to absorption of pelvic indurations and parametrial masses of inflammatory tissue to such a degree as to approach clinical cure and to make surgical intervention unnecessary.

A small group of patients with fixed uterine displacement, with cicatricial masses, and chronic suppurative areas, will fail to respond. Both from reports in the literature and from personal experience when operation is required after conservative therapy, the procedure will need be less radical, more organs may be saved, the menstrual function maintained, and the patient's health thereby conserved to a greater degree than has been possible in the past with radical extirpation of the pelvic viscera.

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## DISCUSSION

DR. GUY W. HORSLEY, Richmond: It is a generally accepted fact that pelvic infection should be treated conservatively, operative intervention being considered only in those cases in which definite abscesses form. Naturally, we have looked for the best form of conservative treatment. I believe Dr. Keyser has given an excellent outline of the established measures now in use, and has stressed undoubtedly one of the most important factors of this treatment, namely, the application of heat locally.

It has long been a problem as to how this can best be done. Many devices have been used, but most of these have been rather complicated, and, incidentally, expensive. A safe and simple method is what is needed—one that will produce even and controllable temperature. The vaginal heater suggested by Dr. Keyser seems to be such an instrument. In connection with the vaginal heater, I would suggest that we use hot abdominal dressings instead of ice packs. It is only logical to conclude that if direct heat is so beneficial, abdominal heat will also tend to cause a more rapid absorption and resolution of the infection. In our experience, the abdominal heat has made the patient more comfortable and has aided materially in the general treatment.

In the supportive treatment we must not overlook the value of fluids. The patient's intake should be at least 3000 c.c. during twenty-four hours. If there is nausea and vomiting, the fluids should be given subcutaneously or intravenously. In this type of case proctoclysis should not be considered, since it would cause more congestion of the pelvic viscera, with the possibility of spreading the infection. Hypodermoclysis will furnish fluids, but

practically no calories; therefore, this leaves only the intravenous and oral routes. The majority of these cases can and will do satisfactorily by the oral method, but we should always be prepared to supplement this with intravenous dextrose when the oral intake falls short.

Dr. Keyser has given us a satisfactory method of applying heat directly to the cervix and pelvic viscera, and I believe this to be one of the best single therapeutic agents that we have in treating pelvic infections.

DR. F. O. PLUNKETT, Lynchburg: I enjoyed Dr. Keyser's paper very much. There is one point I should like to mention. I disagree with Dr. Keyser in stating that the electric cautery is so dangerous in producing stenosis of the cervical canal. I grant you that if it is not properly used it is very, very dangerous, and will produce stenosis of the cervical canal; but if, in the first place, you are careful not to produce too deep striping, and, in the second place, if you will follow up your cauterization with the proper treatment afterwards (that is, have the patient return to the office at least every ten days during the first six weeks and clean out the cervical canal), then it will be the rarest thing that you will have stenosis of the cervical canal.

DR. KEYSER, closing the discussion: The point brought out by Dr. Horsley, as to the use of hot abdominal dressings, I think is quite correct, particularly in cases of spreading pelvic pertitonitis. Large, thick compresses can be applied quite satisfactorily, using an electric baker over them if necessary.

I think undoubtedly, that in using a vaginal heater of any type over a period of days, the concomitant use of an ice bag during that period would be contra-indicated.

With regard to my criticism of the electric cautery, of course, any generalization should always be qualified. I have used the cautery in many, many cases. I do believe, however, that the cautery applied with spoke-wheel radiation, as it has been called, will miss many of the glands which lie high up in the canal. It has been my experience, where I have been a little over zealous in cauterization to have a rather miserable patient on my hands. That experience is not singular. Masson, of the Mayo Clinic, has called attention to the fact that radical hysterectomy for stenosis has been required in a number of these cases. Likewise, Curtis and Novak call attention to the misuse of the cautery in its endocervical application. The cervical canal should be treated very cautiously with the cautery, if at all. I have no doubt that in the general treatment of cervicitis in the hands of the conservative, it may continue to be used with some degree of satisfaction. However, I do not believe the results will equal those obtained by electro-surgery.

## STATE MEDICINE PROBLEMS.*

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If time permitted I would like to ask each of you this question: "What is your conception of State Medicine?" I have asked this question to a large number of doctors and have been not a little surprised at what the term appears to embrace in the minds of most of them. The popular conception seems to be a communistic state in which physicians are subsidized by the government, with consequent destruction of initiative and individualism—a condition threatened, but not now existent. Such a condition is desired neither by the government nor the laymen, and certainly not by the medical profession. Nor is there but slight chance that such a state will come to pass. However, State Medicine under a different definition is not only an entity now, but is here to stay. And rightly so.

The various divisions of our government, from the small rural community to the Federal Government, have very definite functions to perform for the common good which require the services of physicians and which should be properly included in the term "State Medicine." The problem of the medical profession, then, is not to prevent the advent of State Medicine, but to prevent it from menacing private enterprise.

The United States Public Health Service and the state and local health departments have done incalculable good to humankind and as a rule doctors cooperate with rather than antagonize these organizations, unless they compete with them unfairly in the practice of medicine. This unfair competition constitutes the real menace of State Medicine today, and, though few doctors have given the matter serious thought, the State of Virginia has been in

*Read before the sixty-fourth annual session of the Medical Society of Virginia, at Lynchburg, Va., October 24-26, 1933.

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direct competition with private medicine for a number of years. This is especially true in regard to the method of handling by the state of the nervous and mental and tuberculous patients. Although these specialties embrace an enormous number of patients, they have long been step-children of the profession. I recall an address a few years ago by a president-elect of the American Medical Association at the time when the tremendous outlay of government funds for the construction of new hospitals for ex-service men (chiefly non-service connected) was being strenuously opposed by the medical profession. After a bitter denunciation of the then existing governmental plans, he made this statement: "Let them (i. e., the Veterans' Administration) take care of the n. p's.; let them take care of the consumptives; but let them leave the rest of the patients to their private doctors." Such an opinion expressed by an eminent specialist in diseases of the upper respiratory tract and spokesman for the American Medical Association is typical of the attitude of a large percentage of the doctors outside of these two specialties. Granting that many doctors prefer to get rid of neuro-psychiatrics and consumptives as soon as possible without considering the problems that may ultimately arise because of their lack of foresight in handling them, if the State and Federal Government are allowed a monopoly in the treatment of these classes of patients, it is not hard to conceive that the next step in State control will be one that will include other branches of medicine. To quote President Roosevelt in a recent address before the American Legion Convention in Chicago: "As every day passes the people of this country are less and less willing to tolerate benefits for one group of citizens which must be paid for by others." He further said: "If the individual affected can afford to pay for his own treatment, he cannot call on any form of government aid. If he has not the wherewithal to take care of himself, it is first of all the duty of his community to take care of him, and next the duty of the state." Although chiefly directed at ex-service men who had been receiving free hospitalization or drawing monetary benefits—or both—for non-service connected disabilities, these words should have a striking application to the present situation in Virginia, especially as it applies to the two specialties mentioned above.

Let us consider these conditions in Virginia. Any patient with tuberculosis who is a resident of the state may receive expert treatment in a well-equipped sanatorium for $1.00 per day if white, 50c per day if colored, *regardless of his ability to pay, provided he can pay that amount.* In other words, a wealthy patient may and frequently does avail himself of treatment far below cost (the state paying the difference), but an indigent who should be a responsibility of the state (if his community cannot take care of him) must frequently depend upon a private institution to give him free care. Recently I attempted to arrange for admission on a free bed in a state sanatorium of a girl eighteen years old who had active tuberculosis and whose home conditions were such that infection of several small brothers and sisters was almost inevitable. The widowed mother was unable to properly feed and clothe the children, even with the aid of the local welfare organizations, much less pay for hospitalization of the sick girl. I was told by the medical director that the free bed waiting list (there were forty-six free beds out of 350) was so long that if the girl's name were placed on it, it would probably be two years before she could be admitted! It is superfluous to say that by then she might easily be dead, with the whole family infected. At that time there were over fifty vacant beds in that sanatorium; vacant because of the inability of those on the free bed waiting list to pay the requisite $1.00 per day.

Two of the most important functions of the state in the field of medicine—I might say the only two—should be to prevent the spread of disease and to take care of those patients with *whatever disease they may be affected,* whose family or community is unable to do so. The experience I recited is a striking example and only one of very, very many similar cases of how woefully short the state has fallen in its duty in both of these particulars. While half a hundred beds in one state institution are vacant and many others occupied by patients who are well able to afford treatment in a private sanatorium, there are literally hundreds—maybe thousands—of consumptives dying perhaps, but certainly spreading the disease to others, who cannot receive treatment because of lack of funds. While such conditions exist, private sanatoria, which in some instances pioneered in the modern treatment of tuberculosis, have had to close their doors or are seriously threatened with so doing because they are morally forced to do about 50 per cent charity work

while many potential patients who are able to pay for private care are being taken care of by the state at $1.00 per day, the taxpayers of the state paying the balance. I wish to say here in defense of the excellent men in charge of the state tuberculosis sanatoria that they recognize the situation as outlined, but must refuse admission to non-pay patients in order to keep within their budget. Furthermore, their attitude is such as to discourage well-to-do patients in private institutions from transferring to a state sanatorium for the obvious reason of saving money.

Let us now briefly consider wherein the state in the management of its nervous and mental patients competes unfairly with private medicine. The state hospitals for the insane are under a different department of our state government and are operated on a different plan both financially and in policy. However, they offer elements of unfair competition to private institutions analogous to the tuberculosis sanatoria, but in some respects more dangerous from the standpoint of private medicine. Different from the tuberculosis sanatoria, no charge whatever is made for treatment, with one noteworthy exception that will be discussed later. Indigent idiots and lunatics in the state are provided treatment without cost (whereas tuberculous patients who might be cured and become assets rather than liabilities to the state are not adequately provided for), and wealthy dipsomaniacs or drug addicts, well able to afford treatment at private hospitals, are accepted without question so far as their financial status is concerned. I should qualify this statement by saying that patients are given the option of paying whatever they wish toward their expenses, but seldom pay anything inasmuch as so doing is not a requirement for admission. The noteworthy exception to which I referred above is the DeJarnette Sanitarium at Staunton. This is a thoroughly modern hospital operated by the state under direction of the staff of the Western State Hospital for the Insane, but advertised as a private sanitarium in open and unashamed competition with similar private institutions. In a communication to one of the staff members of a private sanitarium, the Superintendent of the DeJarnette Sanitarium gave as one reason for the latter's existence that it was to provide better treatment and accommodations to patients of means who were dissatisfied at the Western State Hospital. The rates charged by this sanitarium are comparable to the lower rates of a private institution. The facts relative to this institution have been brought out so forcibly and well elsewhere that I do not feel that it should be in the province of this paper to enlarge further on the simple statement of its existence. Let the plain fact suffice that the State of Virginia in this instance is competing in the most unfair way possible with the private nervous and mental hospitals not only in Virginia, but in other states (since its patients are not limited to residents of Virginia).*

Lest some of you assume that we who are being directly affected are griping solely because we are being hard hit, I wish to point out just how you as a specialist in some other field or as a general practitioner are being affected and will be further affected if the competitive practice of medicine by the state is not curbed. One of the chief present dangers is that those well-to-do patients who are receiving treatment by the state below cost are becoming "cheap-fee" minded. How many times have I had a prospective patient 'phone me asking for the price of an examination, never to hear from him directly again, but to find out later that he had gone to a state sanatorium where he could get the same examination for half our charge. It must be remembered that private physicians and institutions cannot compete either in treating or examining patients with state doctors, whose over-head cannot worry them. It is only natural for a patient who can get an examination and treatment for one condition cheap to expect charges for other ailments to be commensurate. And why shouldn't he? Why the discrimination? If one can get his lungs examined cheap by a good man, why not his stomach? If he can get an X-ray of his chest cheap, why should he have to pay a comparatively large fee for an X-ray of some other part of his body? If he can get treatment for tuberculosis at the rate of $1.00 per day or for a mental condition for nothing, regardless of his financial status, why shouldn't he get similar cheap treatment for diabetes or Bright's disease? This is not idle speculation. It is a trend of thought inevitable under such existing cir-

*On October 20, 1933, after this paper was written, the General Hospital Board adopted a resolution proposing that the DeJarnette Sanitarium be made a part of the Western State Hospital and that all patients be admitted to the sanitarium according to law, with charges to be made as fixed by law. This action came as a result of complaints from private sanitariums of unfair competition.

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cumstances. And such a trend of thought might easily lead to just that form of State Medicine that so many of us fear—a subsidizing of all doctors by the state as a necessity in order that the practice of medicine might not die.

Another problem relative to State Medicine that cannot be disregarded is the potential, and in some cases actual, danger of state doctors employed to treat tuberculosis or nervous and mental diseases branching out in other fields. On a salary for treating patients in a state institution (and presumably his entire time is devoted to his work), pay for such extra work, in competition with general practitioners in the vicinity, is "velvet."

So far I have dwelt on the subject chiefly as regards the obligations of the state to the patients and the medical profession. Let me now point out the obligations of the doctor to himself and his fellows. I have implied that few doctors realize the significance of present-day State Medicine. Many indeed are lending their hearty support to the present scheme and are unwittingly furthering the advent of a more alarming state of affairs. To be specific: A well-known Virginia doctor made a diagnosis of tuberculosis in the case of a well-to-do patient who consulted him, and advised the man to take sanatorium treatment (this incident was told me by the patient himself, who was later under my care). Knowing of Asheville as a resort for the tuberculous, the man expressed the desire to enter a private sanatorium there. The doctor told him he should by no means go there, as Virginia had excellent state sanatoria with almost nominal rates and he would not be doing his duty to his state if he went to a private sanatorium for treatment. Duly abashed for his lack of patriotism, the man went to a state sanatorium for approximately two years. During that time he cost the state enough to keep two or three deserving indigents, whom the state would not accept, for several months at least. And remember, this man thought he was morally obligated to make himself an expense to the state even though able and willing to pay his way—because of the advice of his doctor! Yet, I have heard that same doctor in private conversation denounce State Medicine as a pernicious machination of the devil himself.

What is the solution? Obviously the state institutions now in existence will continue to function and should do so, but they should so function as to fulfill the obligations of the state to its citizens in the domain of medicine. The private institutions with whom they are competing have no hope nor desire that they cease to operate, but do feel very strongly that it is not only just to the patients, the medical profession and the taxpayers that they operate in such a way as to take care of all those patients who should be wards of the state, and to eliminate the element of unfair competition with private hospitals. Other states have in operation a sliding scale of rates ranging from zero up, according to the ability of the individual to pay. The disadvantages of such a system are obvious. It is virtually impossible to enforce it fairly and if enforced would not do away with the element of unfair competition. No private hospital can compete with a state institution the management of which does not have taxes, insurance, etc., to increase the over-head expense. The only solution which would be just to all parties concerned, and one quite simple, is for the state to accept all patients who are unable to pay private rates and to refuse admission to all others. Those who are able to pay and those who are not constitute a problem which will not solve itself. I have used the term indigent as applying to the type of patient who cannot pay his way even at a state sanatorium. It is possibly an unfair term because of its implication of pauperism. It must be remembered that the treatment of tuberculosis and often nervous and mental diseases extends over a period of months always and often years, and many a hard working man with a family, who barely lives within his income and who has saved only enough perhaps to take care of his wife's next confinement, is very much "up against it" when he is found to have tuberculosis. When his income stops his family is not provided for and he can certainly not afford hospital treatment, at even the cheapest rate, for a considerable period of time. His disease makes him an indigent and he must depend either upon local or state charity or the kindness of a private institution. The solution I have offered would provide for him. It may—probably would—be necessary to have social service organizations in each town or county in the state to weed out the patients who should not be eligible for treatment. The fact that no charge whatever is made would prevent many of those patients who are well able to afford private treatment from applying for ad-

mission out of shame if nothing else. Thus, the job of these organizations would not be difficult. It is entirely possible that the local health departments, whose sanitation officers and nurses are usually well acquainted with the financial status of the members of their community or county, could take care of this problem.

There are many activities of the state in the field of medicine that I have not discussed, such as the diphtheria prevention and smallpox vaccination clinics, the venereal and tuberculosis diagnostic clinics, the State Laboratory, etc. For the most part these activities are in the realm of preventive medicine and, as I mentioned before, having in large measure the co-operation of the doctors. They could not exist otherwise. Nor could the results that have been obtained in the control of communicable diseases have taken place without an organization such as the state has effected. Private medicine should have no kick coming in this regard, *as long as the state diagnoses and treats only those patients who are unable to pay for such work.* I have said that state activities could not exist without the co-operation of the medical profession. Let me repeat and emphasize this fact—and it applies not only to the activities just mentioned, but to those discussed earlier in this paper. If appropriate legislation is not put in effect (as we sincerely hope will be the case), the doctors themselves can, by concerted effort, easily control the situation. State Medicine should work with and be a help to private medicine, not a competitive organization to put the latter out of business. But, let me conclude by saying that if present conditions continue to exist, with the tacit consent and co-operation of the doctors throughout the state, further inroads by the state into the field of private medicine will inevitably follow.

### DISCUSSION

DR. JAMES KING, Radford: As Dr. Flannagan has adequately presented the problem of State Medicine as it applies to the treatment of tuberculosis, I shall confine my part of the discussion of his paper to the situation now existing in the mental institutions of the State. I refer in particular to the DeJarnette Sanatorium at Staunton. I shall leave to others the discussion of what is being done at the Southwestern State Hospital in Marion. The DeJarnette Sanatorium began operation in 1932. The General Board refused to sanction the opening of this unit at the meeting prior to the one at which it was adopted. The excuse for this entrance into the field of private medicine was "to afford people of moderate means private care where they did not choose the wards of the insane hospitals."

There was erected, accordingly, a private unit two miles from the Western State Hospital, which cost the State of Virginia $100,000. Do any of you know of any State institution that has or is advertising? The DeJarnette Sanatorium saw fit to send out catalogs, to distribute postcards, to use a separate letter-head, carefully avoiding any mention of this institution's connection with the asylum. In other words, it intended to deceive the medical profession into believing that this Sanatorium was just another private hospital for the care and treatment of nervous cases.

From its very beginning the DeJarnette Sanatorium admittedly set forth to make money. It avowed its purpose to capitalize the mentally sick citizens of Virginia. Even the State Penitentiary has ceased to engage in activity in competition with its citizens.

The State takes a hand in educating many of its young women and men to engage in the practice of medicine. The training is long, and arduous and expensive. Does it stand to reason, then, that the State—having made them physicians—shall straightway destroy them? And shall the State deliberately go about commercializing the insanity of as many as possible of its citizens?

If the State feels it is incumbent to afford less expensive sanatorium and hospital service to its well-to-do citizens, shall it not feel moved to also furnish all of its thrifty citizens at a cheaper rate of food, and clothing, and housing, and transportation, and heat and light and water and power and literature and legal service, and insurance—and indeed all their needs? If not, why not?

All of you are acquainted with the fact that a good surgeon may charge and receive in this State as much as one thousand dollars for a difficult operation. Since the DeJarnette Sanatorium was created to save well-to-do people of this State money in the treatment of its mentally sick, why shall not the State of Virginia build and man and maintain here and there throughout the State general hospitals and surgical units and special hospitals, by fleeing into which its citizens may escape paying the fees of private physicians who are engaged in the private practice of medicine without State aid?

The State must fulfill its duty in caring for its indigents. And yet, if you please, the Western State Hospital is crowded to the point of bursting with patients. At the Eastern State Hospital, eighty-five inmates are sleeping upon pallets (not beds) laid down in corridors! Is it not surprising, then, to learn that the State wishes to erect a $15,000 unit to the DeJarnette Sanatorium while the proper charges in another State institution sleep on the floor? At the Central State Hospital, at Petersburg, there are 350 patients crowded in the wards over the maximum accommodation. The State Colony, at Lynchburg, has a waiting list of over 200. At Catawba there are over ninety applications on file for admittance, and there would be more if the long list was not so disheartening to physicians.

And yet the State can build and maintain a private

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sanatorium for the care and treatment of fifty-three patients! It can afford to provide one physician for the care of its thirty private patients, while four physicians attend 2,000 inmates of the Western State Hospital. It can engage eight graduate nurses to serve these thirty patients at the Sanatorium, while only four are in attendance at the Western State Hospital. Apparently it matters not that eighty-five patients have no beds, that hundreds of others are cramped into crowded and unhealthy conditions, while hundreds more await the opportunity to be received into a State institution.

The Superintendent of the Western State Hospital has boasted for years that no habitue entering his asylum received whiskey or drugs. And yet, two miles away he personally directs the administration of these very drugs to those who are fortunate enough to raise the ante. I ask you if there is any justification for this discrimination?

Let us pause for a moment to observe the financial conduct of the DeJarnette Sanatorium. It is State-owned; therefore there is no return to be made on the $100,000 investment. For the same reason there are no taxes to be paid. Inmates of the Western State Hospital are used in part to serve the patients of the Sanatorium. The products from the State-owned farm are used for consumption of the Sanatorium. Staples are purchased practically at cost through the State Purchasing Agency. One physician is employed. The Superintendent of the Western State Hospital conducts the place, giving two or more hours per day to thirty patients, while the regular 2,000 inmates that are the proper charges of the State are allotted the balance of the time. Physicians on the pay rolls of the Western State Hospital collaborate with the physician at the Sanatorium. Is it difficult to believe, then, that this institution is making money?

Does it seem plausible to any of you that any private enterprise can compete with such unfair competition? In the end the many triumph over the few. And the use of the taxpayers property is not limited to citizens of Virginia. Eight patients have been received from West Virginia; four from far away New York; five from Washington City and one from distant Montana.

What is to be done about this system that is galloping upon the private domain of medicine that is more intolerable than all the evils implied by the term "State Medicine?"

Shall we consult the General Board for Insane Hospitals? That has been done. They are familiar with all the facts I have enumerated and more. A few of the members of this Board recognize the hazard of the State entering into the private practice of medicine. The two physicians who serve on the board of fifteen have vigorously protested the operation of this Sanatorium. The majority, however, consisting of laymen, do not care what becomes of the medical profession. They are not concerned with our economic welfare and for reasons political or otherwise, they permit ruinous and destructive competition to continue without the raising of an eyebrow. Let it be said definitely, that the majority, not all, of the members of the General Board have turned their backs upon the rights of the general practitioner and refuse to exercise their power to rectify the situation.

It is clearly, then, *our* duty to voice our emphatic objection to these unfair practices. We have been challenged to defend the field of private medical endeavor. Should we of this Medical Society, representing organized medicine in this State, give even so much as our negative consent to the continuance of the DeJarnette Sanatorium and other similar activities, then we can begin now to reconcile ourselves to the sacrifice of the private practice of medicine. Surely we cannot endure the direct opposition of the State.

DR. W. T. GRAHAM, Richmond: I want to thank Dr. Flannagan for an invitation which I received late yesterday afternoon to discuss his paper. I think it was very generous of him to ask me to do it, and I think he was just as frank and honest as one can possibly be, because he mailed me a copy of his paper; and I don't think he came here with any idea of creating a row or disturbance. I think he is like the rest of the physicians in Virginia and wants to do right, and I think the State Board of Health wants to do what is right. We had no desire whatever to get into the field of curative medicine; and, wherever there is a borderline condition, if you can convict us of a mistake then we want to correct it. If you will do your part just as well as we do ours, then you need not trouble about State Medicine.

Some time ago we found out that one institution was making X-rays. We asked them to stop—in fact, insisted that they do stop, except in emergency, and when requested by local physicians. In one institution, also, we found that the younger doctors were doing some private practice in isolated sections; and we stopped that except in emergencies. We do not want State institutions to engage in private practice in competition with you. What we want to do is to prevent people from getting sick and, when they do get sick, help them get well. We do owe an obligation to the doctors; but there are about two million people in the State who have to be looked after, as well as the doctors. In doing that we do not have to trample on the toes of the private practitioners, and we dont want to. I think where there is any misunderstanding or disagreement we are perfectly willing to meet with you people, individually or collectively, and are perfectly willing to do what the Medical Society of Virginia wants us to do and what it will sanction. We have found things that needed correcting and have corrected them as best we could. We welcome your help in keeping from doing wrong. What we want to do is to help the laity and cooperate with you whenever we can.

Those of you who are not charged with getting funds for State institutions do not know the sleepless hours and the amount of sweating of blood that we who have that responsibility put through. It is awfully hard to get money when there is no money to get. You do not hear about our problems. We shall welcome your help

in solving them, and I assure you again that we do not want to tread on your toes by engaging in private practice.

DR. WARREN F. DRAPER, Richmond: I want to express my appreciation of Dr. Flannagan's very interesting paper. There are several points to which I should like to refer.

Dr. Flannagan pointed out the unfortunate situation in which some of the sanatoria find themselves in regard to meeting the demands for free beds. When the last General Assembly met it could not foresee what was going to happen in the economic situation and it made appropriations which, in its judgment, were adequate at that time. Many people were unable, however, to pay the one dollar a day required at our sanatoria and, as Dr. Flannagan says, we now have some fifty unoccupied beds for pay cases, while there is a long waiting list of patients who need free beds. Now it is very unfortunate of course that persons critically in need of sanatorium care, should be excluded as long as there are empty beds available. The matter was taken up recently with Governor Pollard and his budget advisory committee. After giving the matter their careful consideration, I am pleased to be able to tell you tonight that forty-one of the fifty vacant beds which Dr. Flannagan mentions will be turned into free beds on the first of November. (Applause.)

Now, as Dr. Graham has said, it is the earnest desire of the State Department of Health to cooperate with the physicians of the State in every way possible. We realize that we cannot accomplish what we are so eager to accomplish in the reduction of mortality and the preservation of health unless you physicians who come in such intimate contact with the people are actively engaged in carrying out your individual health activities. We must have your help. Who is really going to reduce infant mortality if it is not you, whose duty it is to watch over the mothers for the months preceding the birth of her child, to attend her at delivery, and to minister to the medical needs of both thereafter?

We want to cooperate with you and we want you to work with us in preventing needless deaths of mothers and children. We have our field of endeavor very clearly outlined. It does not conflict with yours; it should supplement and aid you. I have been in contact with most of the officers of this association. We have no bones to pick and no disputes. I like to think that the health department is better understood now than it was two years ago, when there was some confusion as to the objectives of our work.

Soon after assuming the duties of my office, I was impressed with the importance of the tuberculosis problems of the State and I was very anxious to deal with them as wisely and effectively as possible. I knew I did not know all there was to know about tuberculosis, and I appointed from the membership of this association an advisory board consisting of four of the leading practitioners of the State in tuberculosis to meet with our sanatorium heads and advise with us as to what is good practice and what is not, and as to what policies are to the best interests of the people as far as the control of tuberculosis is concerned. We have had several meetings; I have been in almost weekly communication with one or more members of this committee; and we have honestly endeavored to work out a sound constructive program.

Now, I was not aware of some of the conditions that Dr. Flannagan mentioned tonight, but I am very glad to have his viewpoint. I did not have a chance to look up the figures before the meeting, but my recollection is that about twelve or fifteen per cent of the beds at our sanatoria are free beds, and that about seventy-five per cent of the total number of patients is either on free beds or on beds for which some charitable institution or agency is paying the one dollar per day necessary. That leaves perhaps twenty-five per cent of our patients who are paying one dollar from their own resources. Possibly a few of these could afford to pay for treatment at a private institution. I will take the matter up with my advisory committee and will make such adjustments as that committee thinks proper.

It is a fine thing to have this opportunity to meet together and to consider the problems that confront us. I shall always be glad to meet with you at any time and to consider any problems that have arisen. We will try to work them out in a way that is satisfactory to all concerned.

DR. J. S. DEJARNETTE, Staunton: Gentlemen, I am a famous man. When I started the idea of having a Sanatorium to take care of people who could not go to a high-priced Sanatorium, I thought I was a benefactor; our General Board thought I was a benefactor; the Legislature thought I was a benefactor; the Governor of the State thought I was a benefactor and backed the idea. The idea was that there are people who would not care to send a loved one to a State Hospital and wanted to get something cheaper than a private sanatorium, and I would give them an opportunity to come and have their loved ones enter the DeJarnette Sanatorium for voluntary patients, a branch of the Western State Hospital. When we started that institution we started it with the idea that any one who wanted could come there and pay the expenses of the institution at about the actual cost. At one time we thought probably we might make a little money and give it to the poor people at the Western State Hospital who have no friends. There were 780 last year who did not get a thing from home—780 poor, helpless people who have been there so long that they have been forgotten, or whose people were so poor that they were not remembered at Christmas time. We dug up something; I contributed something myself; I don't boast about it, but I did, to give them each a nice present.

My idea was to give people of moderate means something they would be satisfied with, something as good as any sanatorium in the country. We gave them, for four dollars a day, a room with hot and cold water, as good diet as anybody could want (better than I have at home), hydrotherapy and all that sort of thing—all

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that treatment free, or at least covered by the four dollars a day, and no extra charges for automobile rides. The State built this institution for approximately $100,000. We have charged nothing for the interest. Had we paid the interest, the upkeep and all other expenses we would have come out, according to our calculations, behind. We are accused of commercializing the insane. Let us see how much commercializing of the insane we have done. I came here thinking I was doing something for the people. Dr. Draper said he was in favor of the people and the general practitioner having a chance. Is the general practitioner complaining? Every practitioner who has come to the Sanatorium says the people of the State of Virginia ought to thank God for having such a place to come to.

Let's see what we have done. The patients who have come there have paid about fifteen hundred dollars a year. We have given them everything we could think of that they might want. Those who have come from private sanatoria have been paying from $4,000 to $2,800 a year—each person. We have saved patients who have come to us and have stayed a whole year, anywhere from $1,000 to $2,500.

Let us see what competition we have with the general practitioner. When a patient goes to a sanatorium, the general practitioner has bidden him goodby. So there are only two people in the State of Virginia that we compete with, and they are the owners of two private sanatoria. We compete with those two, I admit, but the private practitioner is not competing with us at all, and we do not compete with the private practitioner.

Ever since 1777 insanity has been considered such an affliction that the State has thrown its arms around these people and has taken them to care for. Now, insanity is a terrible thing; I expect within the sound of my voice are many who have some loved one who is so afflicted. Those of you who would be willing to send them to a sanatorium and save from $1,000 to $2,500 a year, assuming they would get as good treatment, if you will send your patients to me I shall thank you. If I am competing with you as private practitioners, tell me how. To do this work I have given my time and have never received, asked or wanted one cent. You may say it is the Western State Hospital's time and the Sanatorium is a special unit of the Western State Hospital. Well, it is. In the evenings I go down and see these patients, talk to them, encourage them all I can and help them in any way possible. I consider that instead of competing with the private practitioners I am cooperating with them, that instead of commercializing the insane I am de-commercializing them at the rate of from $1,000 to $2,500 a year a piece; and if that money came out of your pockets I think you would hesitate a long time before you refused to send them to me on that account.

Now, I think anybody that knows me knows that I could not build a sanatorium. Everybody that goes to the DeJarnette Sanatorium knows that it is a branch of the Western State Hospital for the Insane. If the people that don't go there don't know, what difference does it make?

A man comes there and says: "Doctor, my child has lost his mind. I cannot send him to a State institution; they say they will lock them up and never let them out." I say: "No, send him to the Sanatorium, and I shall be glad to take care of him."

In regard to room, I have not refused an application to the Western State Hospital in ten years for lack of room. The law is that patients must be sent to the nearest or most convenient State Hospital. At the Western State Hospital every man is taken who applies whatever may be his condition. Two came there a short time ago, dying. We took them in and did all we could, though we told their friends they were dying. We admitted 876 last year and furloughed 1,060; sexually sterilized 105, and discharged 424 as recovered. That is the record of the Western State Hospital for last year. All the doctors that come to our Sanatorium are surprised that we have such an institution. I am not knocking other institutions, but I do believe, instead of commercializing the insane, I have de-commercialized them.

Now, the General Board met on the twentieth of October (this month). They heard complaints that we were making money. The General Board decided not to try to make any money, to give the best care possible to people who want voluntarily to come to an institution that has better equipment than the average State hospital. Where the State hospital is run for anywhere from $150.00 to $200.00 a year per patient, this institution was run at $1,500 a year. We are going to cut the expense at the DeJarnette Sanatorium to three dollars a day, or $1,092 per year which is as little as we can afford to have it. We have one nurse there to two and a half patients; we have thirty patients and about thirty employees. I heard here that we have all the force of the Western State Hospital supporting those patients. Employment at the Western State Hospital is part of the treatment. Patients are delighted to go down to the Sanatorium where they get extra good fare, play golf, enjoy the life of the institution, and receive pay for their services. Some get well and go home. We have eight patients from the Hospital working at the Sanatorium.

If I am competing with a single private practitioner in any way I want to hear about it. The object is to benefit the greatest number of our people. Dr. Draper says he wants the people to be benefited. He expressed that, and expressed it well. Our Sanatorium patients are those who are sent by members of their family and their friends to the DeJarnette Sanatorium, and they send them there because they cannot afford to send them to a high-priced place.

Now, as to competition by the State; why not have all of our Wassermanns, etc., made by private practitioners or by some private concern doing that work. And yet I believe this department is one of the greatest assets of the State and of the general practitioner.

We are not making a cent at the Sanatorium; the

State says we cannot charge more than it costs us. When we get more patients, the price will be cheaper. The patients there have single rooms with hot and cold water, a fireproof building and all modern treatment.

If any of you gentlemen who think I am competing with you unjustly and unfairly, have a loved one or friend who is insane, if you don't send them to the Sanatorium I have no quarrel with you. All of you who think I am trying to help the people of moderate means, send them to me, and I shall be glad to receive them and thank you.

DR. A. M. SHOWALTER, Christiansburg: I assume the purpose of the Medical Society of Virginia, from its inception, has been to bring together the physicians of the State, in order that they may discuss and work out plans by which the physicians in turn may be of more service to the citizenship of the State.

We have listened to a very interesting discussion in which some rather critical and startling statements have been made. In rising to discuss Dr. Flannagan's paper, I do not know that I am familiar enough with conditions at Staunton or Catawba, so that what I may say may be of much help; I would, however, appeal to the physicians of the State to acquaint themselves a little more in the future than they have in the past concerning these State institutions about which so much has been said this evening.

I have never been to Dr. DeJarnette's Sanatorium. I understand it is a splendid institution. I have been to Catawba Sanitarium several times, although I did not know about all the things that Dr. Flannagan said are going on over there.

The question I desire to raise is, to what extent am I, or are you, fulfilling your duty to this Society, to the end that justice in this matter we are now discussing may fairly and squarely be worked out?

I have no word of criticism for the work the State Board of Health is doing in Virginia, either at the present time or during the past. I was somewhat surprised recently on a visit to the Southwestern Virginia State Hospital, Marion, Va., to note the expenditures in the X-ray and operating departments which the taxpayers in the State of Virginia have provided for. I do not believe there is an operating room in the State of Virginia or in the South so beautifully and expensively equipped as the one at the Southwestern Virginia State Hospital, Marion, Va. Yet this investment in the operating room and X-ray department is apparently intended to serve the 1,200 inmates of this institution. This struck me as being quite unusual and out of place when compared with the operating room and X-ray department of the University of Virginia Hospital which serves thousands of people as compared with the limited number at Marion, Va.

Someone has aptly said, "There are three sides to every question—your side, my side, and the right side." Suppose we wake up and take enough interest in these matters to see that equity and justice are carried out. It is to this end that I have addressed you for a few minutes.

DR. J. SHELTON HORSLEY, Richmond: It seems to me that the medical profession of Virginia has it entirely within its power to ward off or control State medicine and to cooperate with the State Board of Health and the State institutions, first of all, for the benefit of the greatest number of persons. If we do not put that forward, certainly we are going to lose the sympathy of the public, lose touch with the authorities, and lose sight of our own ideals.

You hear about the infringement of the rights of the private practitioner by the health officers, and they do suffer some loss. I have been a private practitioner out in the country where you could not drive a buggy but had to ride a horse over the mountains, and it is not just an academic question with me, for I have been through it. About six or seven years ago when I was president of the Medical Society of Virginia, there began to be a big sentiment to have the State free from diphtheria; and Dr. Ennion Williams, who was Commissioner of Health then (you know how enthusiastic he was), had this idea uppermost in his mind. I said: "Suppose we get every county in the State to cooperate with the Health Department in giving the toxin-antitoxin, will you be willing to it?" He said: "Not only willing, but glad to do it." I said, in my experience: "Well, I hope and believe we can do that." So I wrote to every county medical society in Virginia, and in those counties that had no medical society I wrote to some two or three prominent doctors, so every county had some communication. I asked that every county appoint a committee of two or three to consult with the State Board and have the State Board do all the work that they could in the administration of toxin-antitoxin and other health measures through the local profession. These local doctors were to charge what they saw fit in instances when they felt the people could pay, and, if they could not pay, to charge nothing. In this way they would maintain contact with the family and gain prestige. Now, suppose that had happened; what would be the result today? From those one hundred letters I got ten replies, and two were abusive. What could the Health Department do when the doctors would not cooperate? Could they let those children die of diphtheria? They sent into the counties representatives from the State Board, sometimes doctors and sometimes nurses, and vaccinated those children. Some of the people said: "Why didn't my family doctor tell me about that? He must be behind the times."

Now, if the private practitioners will cooperate with the State Board of Health in such matters as that, they will maintain their prestige and will increase their income. If they are not going to cooperate and help in this thing, just as surely as the sun will rise some sort of State medicine is going to come, and there is no use in whining about it after it does come, when it could so easily have been prevented. What do you think the State Legislators would say if you were to say to them: "You can't do this thing, because it interferes with our private practice." They would snap their fingers at you and say: "Well, we are looking after the taxpayers and

are not interested in promoting the welfare of a small group of doctors."

DR. C. LYDON HARRELL, Norfolk: Dr. Flannagan has presented us with a very interesting paper. He told us some things that are good for all members of the medical profession to know and some things he said should be investigated if we wish to check the inroads of State medicine.

As to his remarks concerning the State Sanatoriums for Tuberculosis, I feel they were a little too severe. These institutions have rendered and are still rendering a great service to our State. They have helped to put the treatment of tuberculosis on a higher plane than I believe it would have been possible to accomplish without them, from the standpoint of education and lowering the death rate from tuberculosis.

Dr. Flannagan states that he thinks the State Sanatoria should treat all cases free of charge who are not able to pay, and those that are able to pay should be forced to go to a private sanatorium for treatment. I suppose I send about as many cases to the State Sanatoria as any physician in private practice, but not one case in ten that I see is able to pay the rates at a private sanatorium, but the majority are able to pay a dollar a day. Now if these cases were denied treatment by the State, they would either get no sanatorium treatment at all, or be forced to leave the State in order to seek cheaper treatment elsewhere.

I feel that every open case of pulmonary tuberculosis should be hospitalized until they are bacillary free or until they have learned to protect themselves from infecting others. It would be impossible for the State to treat free of charge even those cases that are able to pay seven dollars a week and no more; it would put too heavy a tax on our people, and there would not be sufficient beds.

On the other hand, I feel that every individual should pay something for treatment if they are able; the indigent should be treated free. My experience has been, and I think statistics will bear me out, that the patient who helps to pay his way will make a better patient, will recuperate more rapidly and follow the cure better after his discharge.

As to the well-to-do, I feel that they should be advised and encouraged to seek treatment in a private institution in order that his bed may be occupied by some one not so fortunate. But if he be a citizen of the State and a taxpayer and should apply to one of the State sanatoria for treatment, I do not believe the State authorities have a right to refuse treatment.

Dr. Flannagan also called to our attention that the physicians in the State sanatoria are examining outside cases and discharged cases for a small fee, that otherwise would go to a private physician. I agree with him that this practice should be discontinued and, if brought to the attention of the proper authorities, will be stopped. I will cite one case to illustrate this. I have a patient that I sent to a State sanatorium several years ago. He was discharged in very good shape after about two years. He has never consulted me since in reference to his chest, but does for any other illness. He goes to the sanatorium regularly for X-ray and examination, has a copy of the report mailed to me and has his wife either call me over the telephone or stop by the office for any comment. As a remedy to this I would suggest that the physicians at the State sanatoria be requested not to examine any outside cases except by written request from his family physician. This will enable us to still seek valuable service as consultants, but at the same time keep the patient under observation.

DR. FLANNAGAN, closing the discussion: I appreciate the discussion of my paper and am gratified at the interest it has aroused. I wish to make it very plain that I have no fight with the State Health agencies. On the contrary, one of my chief objectives is to help them in their work.

Tuberculosis is a contagious disease and it is vitally important that those who are spreading it be cured if possible, but certainly isolated or trained in preventive measures. If the State takes care of all of these, whether they can pay a dollar per day or nothing, there will be no room in the State Sanatoria for those who can pay private sanatorium rates. Thus, the duty of the State to its citizens in the realm of preventive medicine will be fulfilled to a large extent and at the same time unfair competition with private enterprise that now exists will be largely eliminated.

I appreciate Dr. Harrell's remarks, but do not feel that they call for any comment.

Relative to Dr. DeJarnette's dissertation, I do not think he could have said anything more that would have better emphasized the points I made relative to the situation that exists in the nervous and mental hospitals.

## VITAMIN D AND VITAMIN D MILK.*

W. L. HARRIS, M. D.,
Norfolk, Va.

If there is any part of the average physician's work that has received scant attention in the past, it is most probably the subject of nutrition, but with the newer ideas forcing themselves to the front, it is up to every physician to master the fundamentals of modern ideas in nutrition and see that his patients receive the benefits of our present knowledge upon the subject.

*Read before the Norfolk County Medical Society, November 27, 1933.

If the child has bow-legs, the mother is going to want to know why the doctor did not prevent it. If the child has a large, boxed-shaped head, contracted chest, badly shaped dental arches and jaws, irregular shaped and decaying teeth, she will likewise want to know why such could not have been prevented, and in the light of our modern knowledge it will be hard for the physician to escape his responsibility.

To those of you who have graduated in medicine within the last ten or fifteen years, the idea of the vitamins seems as a matter of fact and nothing unusual, but to those of us who graduated twenty years or more ago, the record of the discovery and development of the vitamins reads like a romance. I can recall very vividly how we pondered over scurvy and rickets; nobody could offer any plausible explanation even up to 1912. It was during this year that Funk, in Germany, discovered the first vitamin, C, or antiscorbutic vitamin. Every body looked upon it with due skepticism and was slow to accept it.

I recall having written a paper in 1913 on the subject of infantile scurvy, reporting a series of 135 cases observed by me during the previous ten years, and I at that time contended that the exact cause of scurvy was not known. We said that it was due to devitalized or denaturized foods caused by prolonged boiling, and that orange juice and fresh, uncooked milk, would cure it, but we did not know just how or why.

Long before vitamins were known the experience of physicians had shown that children suffering from rickets could be cured by the giving of cod liver oil. It was in 1916 that the English physiologist, Mellanby, discovered the antirachitic vitamin, or vitamin D, and his reports in 1918-19 give a clear-cut proof of the soundness of his theory and the value of this new vitamin in its relation to rickets. He used cod liver oil in his experiments.

McCollum and his co-workers at Hopkins, after diligent research, verified Mellanby's discovery and published, in 1922, a very elaborate account of their experimental work.

For a number of years there had existed a more or less vague opinion that the incidence of rickets was in some way connected with sunshine, fresh air, and other hygienic factors in the child's environment. That ultra-violet irradiation, however, constituted a specific cure for rickets was first definitely established by Huldscinskey, a German physician, working in Berlin during and immediately after the World War. For some time scientists were puzzled to reconcile the two discoveries—that of a specific antirachitic factor in the food, and that of the antirachitic action of ultra-violet rays—but the riddle was solved independently and almost simultaneously by Hess, of New York, and Steenbock, of Wisconsin, who announced in 1924 that antirachitic potency could be developed in a number of different biologic materials by exposure to rays of the mercury vapor quartz lamp.

Steenbock, of the University of Wisconsin, realizing the value of this discovery and the danger of its being promiscuously commercialized, secured a basic patent on the principle of conferring on any kind of foodstuffs antirachitic properties by irradiation. Dr. Steenbock assigned this patent to the Wisconsin Alumni Research Foundation, a non-profit sharing corporation organized to develop patentable ideas discovered at the University of Wisconsin.

Hess, in America, and Rosenheim, in England, lay claim to the discovery that ergosterol, which is found in many foods and in the human skin, can be converted into vitamin D by ultra-violet light. Windaus, in Germany, received the Nobel prize for this discovery.

What is the function of vitamin D? It is ordinarily thought of as the "bone forming and tooth forming" vitamin. It is certain that its presence in the body helps to keep the concentration of both calcium and phosphorus in the blood at a normal level. Whether it aids in absorbing these elements from the digestive tract, or prevents abnormal excretion of them, or causes the deposition of proper amounts of calcium and phosphorus in the bones has not been adequately studied. Probably it does all of these things. *The prevention of mineral loss is the specific function of this vitamin.*

Dr. McCollum says that the discovery of vitamin D in its relation to normal bone growth is one of the greatest contributions to public health ever made by science.

### OCCURRENCE OF VITAMIN D

It is abundant in fish liver oils, notably the cod and halibut. It occurs also in fish flesh to a limited extent, especially in the fatty varieties such as herring and salmon. It occurs sparingly in yolks of eggs, milk, butter and cheese. This comprises about

the whole list in the light of our present knowledge of foods.

In the tropical and subtropical climates an abundance of vitamin D may be obtained from the direct rays of the sun, converting the ergosterol of the skin into vitamin D, and the natives do not have rickets. In the extreme northern climates where there is little sunshine most of the year, and the natives live chiefly upon fish and fish oils, they do not develop rickets. In the temperate regions children have to be protected by clothing for the greater part of the year; hence they get little direct sunlight on their bodies except in the few summer months, and rickets is of very common occurrence.

Light as it comes from the sun to the earth is rich in ultra-violet rays, but in passing through the layer of air laden with clouds, dust, and the smoke of cities, most of the ultra-violet portion is filtered out and but little remains when the sunlight actually reaches us. Modern civilization, through the advent of clothing, indoor life, and air pollution, has defeated Nature's plan for us to make all the vitamin D we require by exposing our bodies to the ultra-violet rays of sunlight. The seriousness of this becomes obvious when we consider that an adequate amount of this vitamin is present in almost none of our foods. Egg yolk contains a considerable amount of it if the eggs come from hens that are getting plenty of sunlight, or are fed a ration to which vitamin D has been added. Ordinary milk contains a very small amount of it, and the various other sources contain mere traces. Of the medicines, cod liver oil and viosterol are rich sources of vitamin D.

These unavoidable consequences of our modern civilization, therefore, have conspired to defeat Nature's plan, and have forced us to devise some way of getting vitamin D from our food. The production of vitamin D milk seems to be the ideal method of doing it. Vitamin D milk may be produced in three different ways: first, by the addition of certain viosterol concentrates to the fresh milk after it has been drawn from the cow. This method is mentioned only to be condemned. The second method is the direct irradiation of the milk by a special carbon lamp and equipment devised for the purpose. This is just being introduced; it is a practical and satisfactory method, but the equipment is very expensive and it requires a trained technician to operate it. The third method is by feeding the dairy cattle irradiated yeast twice a day in the ordinary grain ration. This is a practical and altogether satisfactory method. Steenbock and his co-workers at the University of Wisconsin were the first in this country to report the production of vitamin D milk by feeding irradiated yeast to dairy cattle. Their first exhaustive report came out in 1932.

The Fleischmann Laboratories (Standard Brands, Inc.) were granted a special license to prepare this irradiated yeast, and they are now equipped to produce this irradiated yeast of standard vitamin D potency in large quantities, and at a reasonable cost. They at first produced a yeast of 25 D potency, but now they have increased it to 70 D potency, and it requires only about a four ounce yeast feeding to be added to usual grain ration of a cow producing thirty pounds of milk to produce a milk of 160 D units to each quart. The vitamin D potency is transmitted only through the fat or cream; hence, skimmed milk will contain no vitamin D.

A Steenbock "unit," or the rat unit, is simply a term to designate the vitamin D potency—or it may be defined as the amount of vitamin D that will produce a certain degree of healing in a given time under certain specific conditions.

The method of increasing the vitamin D content of cow's milk by the feeding of irradiated yeast to the dairy herd is no longer in the experimental stage; every detail has been carefully worked out, and now it has been so standardized that it is absolutely dependable. The process is very simple. Taking into consideration the amount of milk produced by the individual animal, and the average fat content of the same, a standardized formula has been devised for each cow, which will produce a milk of a certain vitamin D potency, and as long as this amount of irradiated yeast is given, there will be a uniform and dependable vitamin D potency in the milk.

Hess and many others have agreed after extensive clinical tests that a vitamin D potency of 160 units per quart is the most desirable. It has been found that it takes a certain length of time of yeast feeding for the accumulation of a standard vitamin D potency in the milk. With ten days feeding of yeast it has been found that 80 per cent of the maximum activation that it is possible to secure is produced. After twenty days feeding the antirachitic activation is brought to a maximum level; therefore it has seemed a safe method of procedure

to follow for the producer to feed for a preliminary period of twenty-one days before placing his milk on the market. This milk is then ready to be tested in a biologic laboratory. The Fleischmann Laboratories will do this first biological assay free of charge. Two quart bottles of milk, properly refrigerated, is shipped to the laboratory, and the cream, or butter fat, is fed to a large number of rats (not less than ten), who are in a rachitic condition produced by a specially fed rachitic diet. The promptness with which these rats heal indicates the vitamin D potency of the milk. Aften ten or twelve days these rats are killed and certain long bones are tested for the rate of healing, the details of which I will not attempt to describe. At stated intervals this milk is again sent to the laboratory to be checked as before. The uniformity of the product is very remarkable—just as accurate and dependable in every way as viosterol, cod liver oil, or halibut oil.

A license or permit to produce vitamin D milk is not granted to any dairymen in any community till the local medical profession endorses the idea and expresses a desire for this type of milk. So far, with two exceptions, permits have been granted only to dairymen producing certified milk, as this milk is produced under most ideal conditions, receiving adequate veterinary and medical supervision.

What are some of the advantages of this type of milk? To those who have given the subject of nutrition much thought it unfolds a wonderful field of usefulness. The product can readily be controlled, and the milk differs in no way in taste or flavor from that of any other naturally produced milk. It is now possible for the physician to assume more intelligently the responsibility involved in controlling the child's diet. It simplifies the procedure from the standpoint of the mother. If she puts her child upon vitamin D milk, she does not have to bother with cod liver oil or viosterol. Another thing is the reduced expense. Vitamin D milk can be produced for about one cent per quart extra expense. Cod liver oil or viosterol, if given, will cost at least ten or fifteen cents a day. Vitamin D milk may be pasteurized or cultured into buttermilk with perfect safety.

Vitamin D milk offers a wonderful diet for the expectant mother, as well as the nursing mother; an almost complete food—a rare combination of calcium and phosphorus, together with vitamin D—so much needed to supply what she is giving to the growing infant.

In my work in the public schools these last few years I have had a wonderful opportunity of seeing the far-reaching effects of improper nutrition of infants and young children. Not long ago, in conversation with one of my fellow physicians on the subject of rickets, he remarked rather scornfully, "why bother about rickets; nobody ever heard of a child dying from rickets." That is just the point. So many people do not worry over any disease or condition that does not produce a fatality once in a while. Physicians often refer to a pelvic deformity, or contracted pelvis, as simply a natural occurrence, whereas, as a matter of fact, this woman might never have had this deformity had she been properly nourished as an infant. Besides the contracted chests and badly stooped shoulders, the condition that confronts one constantly is the frightful condition of so many children's mouths—dental caries, contracted and misshaped arches, malocclusion, in many cases almost a "dental cripple." In the light of our present knowledge of nutrition and development, most of these conditions are the result of improper food or improper feeding in infancy or early childhood.

Just a thought in passing regarding dental caries. The foundation for the first teeth is laid many months before the child is born, and this may account for the fact that these teeth are often defective, in spite of all prophylactic measures employed in early infancy. The permanent teeth may be influenced to a great extent by what is done for the child during infancy and early childhod. For years the mother has been condemned for allowing her child to eat candy and other sweets, saying it would cause her child's teeth to decay. This theory was formerly accepted by everybody, and is still accepted by those who are not acquainted with recent developments in nutrition. There is much research work upon this subject in the last few years, and it has been clearly shown that the chief factor in dental caries is the absence of vitamin D and sufficient calcium and phosphorus in the food, together with insufficient vitamin C, which controls the condition of the gums and mucuous membrane of the mouth. Sweets and sugars have nothing to do with dental decay, *per se,* and they act only by cutting out the child's desire for more substantial foods. It is said that the West Indian negroes eat a great deal of

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cane sugar, yet they have splendid teeth as a rule. No doubt their abundance of vitamin D, through sunshine, has a strong bearing in this case.

It is too often thought that as soon as a child passes through infancy and early childhood he needs no further regulation of his diet. This is a sad mistake. He needs a well-balanced general diet to which at least one quart of milk in some form should be added. There is no other food that gives such a happy combination of fats, proteids, carbohydrates, mineral salts, and if vitamin D can be added, there is no one article of food that can approach it for the growing child.

A low blood calcium—what does it mean? It could mean a lack of sufficient vitamin D in the diet. Leading authorities claim that sufficient minerals for all human needs should be obtained from our foods, and not from the drug store.

Experience, as well as scientific studies, has demonstrated that milk is the only food for which there is no effective substitute. There is more real food value in one quart of milk than in any other one article of diet that may be bought for the same price.

A child may be on what seems a well-balanced and sufficient diet, but is not doing well as far as general nutrition is concerned. If to such a diet one quart of milk is added, the results are often astonishing.

Quoting McCollum again, "When one studies mankind in various climates and under different economic conditions with the dietaries which are available to them, and attempts to appraise the importance of the dietary factor in determining their status, one finds convincing evidence that nutrition outweighs in importance either heredity or climatic influences, important as are both of these."

The criterion of what constitutes a healthy and well-nourished child varies very widely. The parents may tell you the child is never sick, not realizing the many hidden nutritional defects it may have. Roberts describes a well-nourished child as having a well-developed body, with firm muscles, good skin turgor, and sufficient subcutaneous fat to form a moderate padding over his bones and muscles. He has a healthy glow to the skin, with the mucuous membranes of the eyelids and mouth a reddish pink, and glossy hair. His eyes are bright and clear—no dark circles under them and his usual facial expression is bright and unworried even in repose. His posture is generally good, with head erect, chest up, abdomen not protruding beyond the chest, and elastic step. In disposition he is usually happy and good natured, and he is full of life and activity. His sleep is sound, his digestion good, his bowels regular. His teeth are sound and properly placed. He is, in short, what nature meant him to be before anything else—a happy, healthy young animal.

Vitamin D milk has been produced in many of the larger cities during the last two and a half years, and it is being adopted by the leading pediatricians and nutritionists of these cities, especially in New York, Boston, Cleveland, Detroit, Philadelphia, Chicago and Milwaukee, and they have found it uniformly satisfactory. This milk can be produced here, and, if it can be shown that there is a demand for it from the medical profession, there are dairymen† here who are ready and willing to undertake it.

*School Administration Building.*

†Since writing the above (November, 1933), one of our leading dairymen has undertaken the production of vitamin D milk and it has been on sale since March 20th.

## THE DIPHTHERIA IMMUNIZATION PROGRAM IN VIRGINIA.*

B. B. BAGBY, M. D.,
Richmond, Va.

In the fall of 1931, Dr. Draper, Health Commissioner of Virginia, appeared before the Executive Committee of the Medical Society of Virginia to ask the Society to help work out a plan for immunizing the children of Virginia against diphtheria.

Some idea of the success of this plan is shown in the following table, compiled from the reports of the Division Superintendents of Schools to the State Department of Education. The figures for the last year are incomplete.

*Read before the sixty-fourth annual session of the Medical Society of Virginia, at Lynchburg, Va., October 24-26, 1933.

TABLE No. 1

SCHOOL CHILDREN IMMUNIZED AGAINST DIPHTHERIA

| | *Cities* | *Counties* | *Total* |
|---|---|---|---|
| 1930-31 | 17,692 | 95,501 | 113,193 |
| 1931-32 | 30,209 | 166,091 | 196,300 |
| 1932-33 | 37,041 | 182,933 | 219,973 |

From this you can see that nearly twice as many of our school children are now immunized against diphtheria as when the campaign began. It is also interesting to note that according to these reports, approximately 50 per cent of our school children have had toxin-antitoxin or toxoid; 43 per cent of the city children and 51 per cent of the rural children.

Below is given a table showing the number of deaths from diphtheria and the diphtheria death rate for the last four years:

TABLE No. 2

NUMBER OF DEATHS FROM DIPHTHERIA AND THE DIPHTHERIA DEATH RATE FOR THE LAST FOUR YEARS

| | *No. Deaths* | *Death Rate per 100,000 Pop.* |
|---|---|---|
| 1929 | 214 | 8.9 |
| 1930 | 172 | 7.1 |
| 1931 | 225 | 9.3 |
| 1932 | 149 | 6.1 |

The rate for the cities in 1932 was 4.2 and the counties 6.8.

TABLE No. 3

OF THE 149 DEATHS FROM DIPHTHERIA IN VIRGINIA IN 1932

21 were under 1 year of age
21 between 1 and 2 years of age
25 between 2 and 3 years of age
22 between 3 and 4 years of age
14 between 4 and 5 years of age
13 between 5 and 6 years of age
6 between 6 and 7 years of age
14 between 7 and 9 years of age
2 between 9 and 14 years of age
11 over 14 years of age

Thus we see that 122, or 82 per cent, of the deaths are under six years of age.

An analysis of the statistics of the Virginia State Department of Health, for many years, shows that 85 per cent of the deaths, and from 50 to 60 per cent of the cases of diphtheria occurred in pre-school children.

From the above statistics it is readily seen that to materially reduce the diphtheria deaths it is necessary to immunize more of our infants and pre-school children.

With this in mind, on January 1, 1933, we began the system of sending a return postal card to the mother of every baby in Virginia on or near his first birthday, asking if the baby had been immunized against diphtheria, and if not, why not. The returned postal cards indicate that the percentage of one-year-old babies immunized in the cities is about two and one-half times greater than the percentage immunized in the counties. This in part may account for the lower death rate in the cities as compared with the counties.

It is interesting to note the reasons given on the cards for not having the baby immunized. In order of their frequency the reasons are:

"Financial," "Neglect," "Have not had opportunity," "Not near a physician," "Lack of knowledge," "Waiting for clinic," "Not advised by my family physician," and "Opposed to immunization."

In my travels I often ask the mother if she has immunized her baby against diphtheria. If she has not, I ask her why not. A large majority of these mothers reply that they have "just neglected it," or have "not been so advised by the family physician."

The State Departments of Health and Education may be able to immunize a large part of the school children, but the wholesale immunization of the infant and pre-school population cannot be accomplished except by the effort of the family physicians.

The Virginia Department of Health is stressing the importance of diphtheria immunization in the following ways:

On every birth certificate sent out by the Department is pasted a slip with the following inscription: *"When the baby is six months old give toxoid to prevent diphtheria."* A card is sent to the mother on the first birthday, again calling attention to the importance of this protection. In every pamphlet sent out from the Department, whenever practical, diphtheria immunization is stressed; and we urge our public schools, Parent-Teacher Associations, Leagues, and Women's Clubs to make the immunization of children one of their major objectives.

Now that immunization in 95 per cent of the children can be secured by one injection of alum-precipitated toxoid, most mothers able to pay will be glad to pay for this protection. Many of the charity cases can be taken care of by the Federal Relief Board which has ruled that physicians can be paid for immunization against diphtheria in definitely indigent cases. But all of the educational propaganda put on by health and welfare agencies will produce comparatively little result in protecting the infant and pre-school child, unless the general practitioner will do his part in notifying

the parents of the importance of diphtheria immunization. The family physician is the one upon whom the mother depends for her guidance in all health matters.

The physicians may secure from us a supply of leaflets on diphtheria immunization to send to their patients with their bills or other communications. These leaflets are being distributed through our schools, Leagues, and Parent-Teacher Associations, but the same circular sent by a physician will be of far more benefit than distributed by any organization.

The most effective way of accomplishing this end seems to me to be that described at the last meeting of the Medical Society of Virginia by Dr. T. H. Daniel, of Charlottesville, who states as follows:

"Personally, I felt that with the families I attended I would have more influence than any public health official or any school authority; and so, at the possible risk of being called unethical, I sent a personal letter to the mothers of children of preschool age whom I had attended in their confinement. I found the records of 175 for whom I could get pretty accurate addresses, and I sent out 175 letters, writing each as a personal letter. I had the letters mimeographed, simply because I was sending out a good many. In the letter I stated that the child had reached the age when it was susceptible to diphtheria, a disease that could be prevented, and urged that these children be brought in for immunization. I stated in my letter that the cost was slight, but that if anyone was not able to pay the fee charged, I should be glad to do it for nothing. As a result of those 175 letters, I had over a 100 children brought to my office for immunization."

What has been accomplished by Dr. Daniel could with profit be duplicated by every general practitioner in the State. If they have no mimeographing machine convenient, we shall be glad to mimeograph a similar letter for any physician in the State, if he will send the stationery, letterheads or postal cards and a copy to follow.

Many physicians in the State are active in this health educational campaign, and the deaths from diphtheria are comparatively few among the patients of these physicians. Further reduction in deaths will be in proportion to the amount of education given by the family physician.

Before closing, it might be well to remind the physicians of the State that the State Department of Health is now able to furnish them at cost the alum-precipitated toxoid which usually requires only one injection for immunization. Drs. McGinnes and Stebbins have found that one dose of this toxoid produces as high percentage of immunity as two doses of the toxoid formerly used, or three doses of toxin-antitoxin. Our Bureau of Epidemiology also wishes to remind the physicians of the State of the fact that approximately 80 per cent of babies are immune at birth, but that most of them lose this immunity by the time they reach the age of six to nine months. Therefore it is recommended that the baby be given the toxoid when six to nine months old, be Schicked at one year of age, and again when he enters school.

### DISCUSSION

DR. F. D. WILSON, Norfolk: Dr. Bagby's department is making a splendid showing in its effort to rid Virginia of diphtheria. Nevertheless, there are somewhere between 150 and 200 deaths from diphtheria annually in this State, so it is quite obvious that the efforts being put forth by his department and the Department of Health must be increased if we hope to improve on the record already made. It is highly probable, however, that there will not be any very great improvement in what has already been done, because the Department of Health and the Department of Child Welfare have put forth (I do not say their best efforts, but have put forth) a very considerable effort, which will be very hard to improve upon.

Now, Dr. Bagby told us another reason why children are not immunized is that the parents are negligent, or the physicians are not sufficiently interested or are even indifferent. He told you that Dr. Daniel said he thought he would have more influence on his patrons than any health officer could possibly have. It would seem, therefore, that if we hope to do anything further than we have already done, or to improve upon our methods, we must educate not only the public but the physicians.

Norfolk has had a very interesting experience in the last few years. The number of deaths from diphtheria, up to the time of a very intensive campaign for diphtheria immunization, was about five deaths per year. Since that time the number of deaths has been about six per year. The population has increased from approximately 73,000 in 1910, to 130,000, approximately, at this time. The Department of Health, in conjunction with the School Board, immunized last year (from last spring to the present time), about 7,000 children. There were 18,000 admissions to the schools this year. Of the new admissions, approximately 13 per cent had been immunized. The number of cases in Norfolk, which had not materially changed in the last few years, I think dropped to about one-half when the intensive im-

munization began. It would seem to be impossible to make any great improvement in what we have already done unless we find some new method, and I believe that there are just two things open to us. The first is to put into effect some plan of compulsory inoculation for school children, in order that there may be no contact for the smaller children at home. We fail to recognize that many of our cases among children of preschool age are due to contact with children of school age. The children of school age get it; they are a little more immune than the younger child at home, they take it home, and the children at home get it from the carriers. While a large proportion of the cases are in children under school age, yet many of them take it from the children of school age.

I took occasion to make some inquiry among the men doing work exclusively among children. I found that four men doing pediatrics exclusively, with fairly large practices, had had no cases during the last five years, yet there have been a large number of cases in Norfolk. These men had not had any diphtheria originating in children among whom they had practiced, during the five years. They had had one or two cases in previously immunized children.

The department has a card about eight or ten inches long and six inches wide, which is sent out to mothers of children recently born. It bears these words: "Have you had your child immunized against diphtheria? If not, why not?" Such a card, placed in the office of the general practitioner, would call attention to the necessity for immunization, and a large number of mothers, I think, would ask the doctor why the card is there. If the Department of Health would take the trouble to send every general practitioner in the State such a card to place over his desk, I believe it would result in a large number of additional immunizations.

I do not believe, however, we can get much further with our work unless we do have compulsory vaccination.

DR. PERCY HARRIS, Scottsville: I am afraid that Dr. Bagby has given the impression that the doctors of the State of Virginia are not cooperating with him as properly as they should. I do not believe, however, that there is a physician in the State of Virginia who would not do everything he could to prevent diphtheria. In most instances, the physicians will tell you, the parents say, just as Dr. Bagby said in his paper, that they do not have the funds, or that they are going to wait until the nurse comes around to vaccinate. I think that is the great drawback.

There are some cases of diphtheria—plenty of them—but they are getting less all the time. I am like Dr. Wilson; I think immunization ought to be compulsory. This compulsory vaccination ought to be done by the physicians of the State, and their remuneration should come from the State, so that they will have some income, because they are very hard up at the present time.

DR. T. H. DANIEL, Charlottesville: Dr. Bagby very kindly sent me a copy of his paper and asked me to make some remarks on it. I have nothing, especially, to say, except to emphasize some of the points he brought out. I believe the solution of this problem of the immunization of children against diphtheria lies with the general practitioner. I do not believe there is any question that he can have more influence with the people than any other agency. My own experience, which I tried out by way of experiment worked out very satisfactorily that way. I think he has already quoted me on it so I shall say no more about it. I have had most satisfactory response on that. Just this week a mother who had gotten my letter about her previous child brought her baby into my office and wanted to know when to bring this one in for immunization.

I think in Dr. Bagby's paper he says that 80 per cent of the deaths from diphtheria that occurred in the State last year were among children under six years of age—the pre-school age. As Dr. Wilson has stated, undoubtedly contacts are brought from school but if we wait for compulsory vaccination we are not going to eliminate diphtheria in the State. We men in general practice have to try to put it over with our own patients. We shall not get them all, but we shall get an increasing number of them to respond to this appeal, I believe.

DR. W. L. HARRIS, Norfolk: I did not hear Dr. Bagby's paper, but I am more or less familiar with the diphtheria situation, as I have been in school health work the last three years. This past summer I made a check on preschool children. Up to six years these youngsters showed only 17 per cent had been inoculated against diphtheria, 17 per cent out of three hundred. There were 83 per cent that were still susceptible to diphtheria. Every child is entitled to a square deal and a fair chance, but they are certainly not getting it now, under the present way of doing things. How this can be handled best I do not know. When the child gets to school age it can be handled, but the majority of deaths are under school age. The general practitioner is certainly not taking advantage of his opportunity to do something for himself and something for humanity. The question is how we can best get at this. I have a number of friends in Norfolk to whom I have been talking during the last few years, and some of them have 95 per cent of their own clientele inoculated against diphtheria. We cannot put it on the State or on this person or the other person. The general practitioner is not interested to the extent of getting something done. It is a shame to let a child go through the most vulnerable age absolutely unprotected against diphtheria.

DR. J. N. DESHAZO, Center Cross: It is as Dr. Harris says; people wait for the clinic now. We went around from school to school and inoculated all who were willing to have it done. We urged them to do it. We charged them fifty cents for the three inoculations we were doing at that time and charged maybe a dime for the vaccine the State furnishes. The people will ask you when you are going to have another clinic. So it is a fact, as Dr. Harris says, that they are waiting for the clinic. There ought to be some standard set as

to what we are going to charge to do this privately. What we charge in the clinic is not enough for individual cases done privately, and we ought to have some standard; the charge ought not to be exorbitant; it ought to be very reasonable, in order to get people to immunize their children. In a colored school a few years ago I did a good many inoculations for which I shall never get anything, but I did it from a humane standpoint.

I think, as someone suggested, it would be a good idea to send out from the State Board of Health to the parents of each child twelve months of age whose birth is registered a card giving them the idea of having the child immunized. The question might be asked them: "If you have not done it, why don't you do it? You ought to."

DR. H. S. DANIEL, Louisa: I should like to ask Dr. Bagby a question, mostly for information. I do not know whether he covered this before I came in. What I wish to know, particularly, is the best method of producing this immunity. He spoke of three doses of toxin-antitoxin, two of toxoid, or one of the new preparation. I believe, from the figures on that, we expect to get 75 per cent immunity. That leaves 25 per cent of children who, after the treatment, are not protected. It is very difficult to get the children back for the Schick test; I find that much more difficult than to get them to take the treatment. I had in one community three cases of diphtheria among children who had had toxin-antitoxin, and that did a good deal to knock in the head all the propaganda the State Board of Health had carried on. Of course, if those children had been Schick-tested, it would not have happened. I have been giving three doses of toxoid and four of toxin-antitoxin. I believe that is safest, to give 95 per cent immunity; then if you do not get them Schick-tested, you have not lost so much. I should like to know the best method, because, if you do not get these children Schick-tested, you have not accomplished so much, after all.

DR. W. A. BRUMFIELD, Farmville: I hate to introduce a note of pessimism, but I do not think we shall get them all protected by any method. We have had smallpox vaccination for a great many years, and we still have cases, although we have compulsory vaccination. A great many parents do not want it done. We had an article in the paper in Prince Edward County saying that all children under five years of age would be inoculated free. Twenty-five per cent of the white children had been inoculated, and only 12 per cent more were done, raising the total of inoculations to 37 per cent by the time they were ready to go to school.

I believe it would be an unfortunate thing to have compulsory vaccination for school children, because we have it for smallpox, and it is almost impossible to have the child inoculated before he goes to school. If we have compulsory vaccination for diphtheria before going to school, I think it would be construed by the parents that the health department thinks it unnecessary before that time. If we do not get the pre-school child inoculated, we shall not prevent the deaths. In a district of 103,000 population, in five years twenty-eight deaths from diphtheria have occurred, most of them among the whites. Whites seem to be much more susceptible than Negroes. Only two of these twenty-eight were in school—only two over seven years old.

I believe, however, we are going to do a great deal more with this alum-precipitated toxoid. I attended the American Public Health Association, and the doctors there were practically unanimous in saying that with the one dose of this we get a higher degree of immunity in a shorter time than with the two doses of the old toxoid, some claiming as high as 98 per cent by the end of two months' time. But if they make a month-by-month check, they will find at the end of one month the rate of immunity is much higher with the alum-precipitated toxoid than with any other method we have used, which makes it very usable during an outbreak.

As I have said of typhoid fever, the disease has to be very near in time and place to make parents take their children to be immunized. So it is with diphtheria.

DR. W. B. MCILWAINE, Petersburg: We have three things to combat in our diphtheria program. The first is the inertia of the parents. I do not believe many of them are actively opposed, as Dr. Brumfield seems to think, but it is due to inertia. That is the first thing we have to combat. It is up to the schools, up to the doctor, up to the public health nurse.

The next thing we have to do is standardize our method of immunization, as Dr. Daniel brought out. Nothing gives it more of a black eye than to have a child who the mother thinks is immune turn around and have diphtheria. It is therefore essential that we tell the parents that the only criterion is a negative Schick test. That does not necessarily mean that the child has to come in and be tested, but it gives the doctor a clear skirt.

We have to develop something which will protect more children in less time, which it appears the bacteriologists are giving us in this new toxoid. If the State Board of Health comes out and recommends that the one dose be given, that it is free from reaction (which people do not like to get), that it will immunize quickly, then the doctors of the State will follow its lead. I have not done it yet; like Dr. Daniel, I have been giving three doses of toxoid; but I am perfectly willing to follow the State Board of Health if they will come out and make a statement.

Dr. Bagby is very wise to bring this subject before this meeting; I believe diphtheria can be eliminated; medical and health workers should see that it is.

DR. BAGBY, closing the discussion: Dr. Harris probably did not quite understand my statement when I said a great many physicians in the State are doing all they can to immunize children against diphtheria, but some few are still opposed to it. It is far from me to criticize the physicians of the State.

I should like to ask Dr. McGinnes, of the State De-

partment of Health, to answer the question about the best method.

DR. G. F. MCGINNES, Richmond: We have been very much interested in diphtheria and diphtheria immunization for the last two years because of the enormous increase in the number of cases which occurred in 1931. Since early in 1932 Dr. Stebbins and I have carried on a rather intensive study in a group of 16,000 children living in various sections of Virginia. We wanted to establish first the relative immunity of rural children of Virginia, and, second, the efficacy of the various immunizing materials.

We found that 90 per cent of the children at one year of age were Schick positive and that the immunity increased until the age of about eleven. There the curve reaches its roof at between 65 and 70 per cent Schick negative and remains constant up to twenty years of age. At one year of age, among children who have been previously immunized, about 90 per cent are immune. That curve, instead of going up, goes down and begins to parallel the curve representing the non-immunized group between 70 and 75 per cent Schick negative between the ages ten and twelve. These curves parallel each other through the age of twenty.

I mention this work because it demonstrated to us that about 50 per cent of the children entering school who have not been previously immunized are Schick negative. This naturally has a definite effect upon any immunization program.

We began our diphtheria immunization work some years ago by giving three doses of toxin-antitoxin at weekly intervals, obtaining about 70 per cent immunity in Schick positive children. After the introduction of toxoid we were able to render about 90 per cent of Schick positive children Schick negative by giving two or three doses at one or two weeks interval.

In discussing this work with Dr. William H. Park, of New York, he suggested that I try some of his highly potent toxoid (toxoid containing ten flocculating units per c.c.). With this material we were able to render 83 per cent Schick positive children Schick negative by giving one dose of one-half c.c. By using two doses of one-half c.c. at weekly intervals we were able to render 94 per cent Schick positive children Schick negative.

During the early part of this year the late Dr. Leon C. Havens, of Alabama, introduced a new product, alum-precipitated toxoid, and sent some of this material to us to try out in our study. With a group of 600 children we gave one dose of one-half c.c. to about 300 and one dose of one c.c. to the other 300. With one dose of one-half c.c. of this product we obtained 93 per cent immunity, and with one dose of one c.c. we obtained 96 per cent immunity in these Schick positive children. This group was composed of both white and colored children. If the colored children, who seem a little less susceptible but a little more difficult to immunize, were omitted and our figures based entirely on white children we would have obtained 98 per cent immunity with one dose.

The reaction from the use of alum-precipitated toxoid has been questioned in some quarters. In our limited experience, we feel that the general reaction following alum-precipitated toxoid is no more than with untreated toxoid. However, the local reaction seems a little more severe. I might warn you that a nodule is frequently palpable at the site of injection for several weeks after the injection of the material.

Our recommendations to our county health officers for the prevention of diphtheria are as follows:

*Pre-School Children*

One injection of one c.c. of alum-precipitated toxoid at or after the age of six months, followed by a Schick test at least six weeks after the injection of toxoid. The second injection of one c.c. of alum-precipitated toxoid is given to Schick positive reactors.

*School Children*

Schick test all children in the grades and give one injection of one c.c. of alum-precipitated toxoid to the positive Schick reactors.

*Question:* When do you get the maximum immunity?

DR. MCGINNES: It has been found that the maximum immunity with alum-precipitated toxoid in experimental animals is at the end of six weeks. With toxin-antitoxin and untreated toxoid I believe it has been shown to be between eight and ten weeks.

## OBSTETRICAL EMERGENCIES.*

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What a fool subject! When my good friend, Jones, wrote me for a paper, I sent him the above title and mailed my letter to him. After it was gone I wished I had sent a different title, because that is a fool title—and covers a lot of territory. Now don't think for a minute I am going to burden you with all the obstetrical emergencies, because they are countless, and any case that deviates from the normal is an obstetrical emergency, so I am going to give you a few cases that have come under my observation as practitioner.

Eclampsia is the first of importance. I never

*Read before the Seaboard Medical Association of Virginia and North Carolina, at Norfolk, Va., December 5-7, 1933.

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empty the belly of a woman who is having fits. I have seen seven cases in my life in which forcible deliveries were made, and every one of them promptly died. Get the fits controlled and the labor or delivery will take care of itself. I can well remember the first case of eclampsia I ever saw. I was sixteen miles in the country and had perfected the delivery of a primipara. I had my grip in hand and was in the act of leaving the house, and had walked a few steps from the bed toward the door. I heard a sound that attracted my attention. I looked toward my patient. Her face was drawn, and arm over her face. Then she began to jerk all over. Such a procedure just about scared the life out of me. She soon got over that fit and said, when she looked up, "I thought you were gone." I wanted to say in return, but of course I did not, "Yes, by God, and I thought you were gone, too." I did not have a blood pressure instrument in those days, but when I felt her pulse it felt to me like it was beating a thousand times a minute. I gave her by hypodermic one-half grain morphine, and by mouth thirty grains of acetanilid and enough more to make her blue, plus Epsom salts galore. That was about 8 o'clock in the morning. She had four convulsions. The salts acted so much we had to change the bed two or three times. The pulse slowed down to 70 and I left her home about 3 P. M. She begged for something to eat. She had no more signs of fits.

One more case of eclampsia is typical of a number of cases I have seen. This was a young woman who had had about three children. Some of her neighbors phoned me to come at once; she had had a fit. I rushed there as soon as I could. Pretty soon after my arrival she had a fit. Blood pressure was high. I treated this woman much in the same manner as I have just outlined. When the fits were controlled, I kept her bowels and kidneys acting with cream of tartar and Rochelle salts, and put her on meat-free diet. She went to term and had a normal delivery. That is the surest and safest method.

There can be no set rule for treating eclampsia. Every doctor must use his judgment and work out his own line of treatment. Whatever works best for me, that is mine regardless of what the books say.

### PLACENTA PRAEVIA

I know so little about placenta praevia I almost hate to mention it. It has been my misfortune to run across four cases, and thank God I have not seen any more. This is an exceedingly dangerous condition. When you go to a woman in labor and find a river of blood flowing from her vagina, you may suspect placenta praevia. A digital examination may reveal a placenta emerging and easily felt. Pack the woman long enough to give her a dose of pituitrin. The dilatation should not be considered; give the dose now, and make all possible haste in perfecting delivery, feet or head foremost. Time is valuable here. Saving life is of first importance. Take care of lacerations afterwards. Placenta praevia will test your skill, and then you may lose a patient. If you are in a hospital and have help, which is so badly needed, things are bad enough, but if you are in the country and you have to be doctor, nurse and all, God only can help you.

### COMPLETE LACERATIONS AND DEEP LACERATIONS

These conditions, from my observation, more often happen in strong, healthy primipara than other women. They are vigorous and strong, and their labor pains are so powerful the perineum often gives way. I have frequently been called to such labor cases, and sometimes the child is already born. These young women, being ignorant of the onset of labor, frequently wait until they get in the second stage af labor, then rush themselves through labor, not realizing what great damage they are doing themselves. Some teaching along this line would serve well. Women between 30 and 40 will often tear or rupture muscles of the perineum without making much visible sign. One woman I well recall, 36 years of age, had her first baby. The head for about two hours had been pounding away on the perineum. I was with her all the while, hoping it would dilate, and, just as the head was about to emerge, she said, "Oh, doctor, something terrible is happening to me." What she felt was those big muscle fibers ripping away. All women after delivery, then and there, should have the floor of the pelvis examined by the doctor, and, if it is found lacerated, even if obscurely, an attempt should be made to reunite those deep muscle fibers. You can do no harm and may do a tremendous amount of good. Eighty-five per cent of them will remain repaired. No time is ever better to stitch up a

perineum than just as soon as the placenta is passed. I have stitched them up with plain white tobacco or cotton twine and they held. I did that rather than wait until I could go to town and get another supply of catgut sutures. That was in horse and buggy days.

Frequently a doctor is called to go to a patient complaining of the colic. Especially is this true of a woman who has concealed her pregnancy. Then the doctor is caught without his obstetrical bag—fifteen or twenty miles from town. There is nothing to do but do the best you can and trust God to do the balance.

One case I distinctly recall. A large girl, weighing close to 300 pounds, had concealed her pregnancy and worked and complained with the colic or bellyache. I was called to her, and the party calling over the phone said the girl had a case of colic. I went as soon as I could, which was about the noon hour, and her mother said the girl had had colic all night and up to noon, but had not lost any time from her work at the tobacco barn. I put her on the bed and found her to be in the second stage of labor. I had nothing but my bare hands, but I stuck to the job and delivered this girl of a sixteen-pound baby. She made a good recovery. So it is well to get all the information you can before going to a patient much distance from the office. In fact, when I was doing a large country practice, I often carried my obstetrical case with me, and it served me well many, many times.

*Uterine inertia* most often happens in the second stage of labor. One may frequently be called by a midwife to see such a case. "Doctor, this woman has given out, and I thought I had better send for you." Some such cases do not respond to pituitary extract, and we are forced to resort to forceps—an instrument that has no doubt saved many lives, but, because of resulting lacerations and cervical tears, has been the beginning of many cancers, caused many deaths, and deformed and maimed many children, almost enough to offset the good it has done.

### ANOTHER EMERGENCY NOT UNCOMMON

Still-births are very embarrassing. Parents cannot understand this, and often the physician cannot understand and explain it himself. Therefore, every effort should be exhausted before giving the infant up for dead. There are two instances that I recall that give me great joy when I look at them. One of these youngsters, now a grown young lady, was still-born, but after about one hour's work my efforts were rewarded and the infant began to breathe. Another, a boy now in his teens, the illegitimate son of an unfortunate school teacher, is her only means of support. So never give up hope. Keep trying, and then try some more.

I wish I might tell how to manage a labor case in country practice. Every case must be managed according to what you find. I would say, first, get a good, stout suit-case; equip it well with sufficient material and instruments and medicine to handle almost any case; put it in your car when you are called; then do the best you can. If you do not have what you need, there are some embarrassing moments for you.

## THE NEUTROPENIC SYNDROME.*

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Reports of this syndrome have appeared principally within the past seven years. In the past two years, extensive research and careful clinical observation have brought out many changes in viewpoint as to the character of the syndrome, the etiology and the treatment. This brief review incorporates these recent views.

*Read at the fifty-eighth meeting of the South Piedmont Medical Society, at South Boston, Va., April 17, 1934.

Neutropenia is a clinical syndrome characterized by a marked reduction in the total number of white cells and a great reduction or complete absence of neutrophiles. It is a constitutional condition or defect which may manifest itself due to one of several causes, even in the same patient.

Reports of this syndrome have appeared in the literature under many different names, such as agranulocytosis, agranulocytic angina, mucositis

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necroticans agranulocytica, monocytic angina, granulocytopenia, granulopenia, idiopathic neutropenia, benign and malignant neutropenia. The majority of authors now use either the terms neutropenia, granulopenia or granulocytopenia.

This is a relatively new clinical syndrome. A few cases were reported before 1922. Between 1922 and 1927 Kastlin[1] was able to find only forty-three cases in the literature. Since 1927, the incidence has increased rapidly, so that now there are more than 500 cases on record.

Since the diagnosis and prognosis of this disease is dependent on an accurate interpretation of the blood picture, it is necessary to have an understanding of where and how these neutrophiles are produced and how they reach the peripheral circulation.

The tissue which gives rise to these neutrophiles is located in the red marrow which is found in the ribs, the vertebrae, the sternum, the bones of the skull and the os innominatum.

If we consider the entire marrow of all these bones as a unit we find that it is an organ of no inconsiderable size, having been shown by Wetzel[2] to have a volume, in the adult human being, of 1,419 c.c., which is thirteen times the size of the spleen and almost equal to that of the liver. The erythrocytes, thrombocytes and neutrophiles grow in this red marrow. It has been estimated that aproximately two-thirds of this red marrow is devoted to the production of the neutrophiles. This seems strange when one considers that there are approximately 4,500,000 red cells to every 4,500 neutrophiles per cu. mm. in the blood stream. But it must be remembered that the average life of the neutrophiles in the blood stream is four to five days, while the average life of the erythrocytes is twenty to thirty days. The portion of the red marrow forming erythrocytes is called the erythropoietic tissue, the portion giving rise to the neutrophiles is called the granulopoietic or myeloid tissue.

The cells from which the neutrophiles develop are fixed tissue cells, reticular cells, found in the interstices between the fat cells of the bone marrow. These reticular cells, with repeated divisions, give rise to primitive free cells which are about the same size and look very much like lymphocytes. These primitive free cells are found in the largest numbers and they are the cells that develop into the myeloblasts. The myeloblasts are the largest of the cells of this series. The myeloblasts, as they develop, become a little smaller in size, develop neutrophilic granules in their cytoplasm and become young myelocytes, sometimes called promyelocytes. As these neutrophilic promyelocytes become older they decrease a little in size and develop more and more neutrophilic granules in their cytoplasm, until the cytoplasm becomes filled with these granules. The nucleus, which has up to this time been round, now assumes a sausage or bean shape and there is evidence of ameboid movement beginning in these cells. These are mature myelocytes, sometimes called metamyelocytes, and designated by Schilling as juvenile cells. Further growth of the metamyelocytes is evidenced by changes in the nucleus and increase in the ameboid movements and they develop into segmented neutrophiles. The nucleus becomes more lobulated with age, first constricting to form two lobes, then three, four, five and more. At the end of four or five days the mature segmented neutrophiles (polymorphonuclear neutrophiles) reach the non-motile, senile stage and phyliologic degeneration begins. It requires from three to seven days for the promyelocytes to develop to the metamyelocyte stage, while it requires only a matter of hours or minutes for metamyelocytes to develop into the segmented neutrophiles. Normally there is always a large supply of metamyelocytes so that the myeloid tissue is ready to meet any emergency. Physiologic degeneration of these neutrophiles takes place in the blood stream, in the tissues and on the mucous membranes.

The mature neutrophiles do not seep out into the circulating blood at a constant speed, but, instead, they have a rhythmic delivery. They reach their lowest numbers in the early hours of the morning. At this time the total white cell count is lowest, as the neutrophiles constitute about 62 per cent of the total white cells of the blood. They then begin to increase in numbers and finally reach their highest point between two and three o'clock in the afternoon, at which time the total white cell count is usually double what it was in the early morning hours. The neutrophiles then begin to decrease in numbers. There is then a second rise about midnight, at which time they begin to decrease again until they reach the low point of the early morning hours. These facts should be taken into considera-

tion in evaluating blood counts in cases of suspected appendicitis, etc., as well as in neutropenia.

Just what the stimulus is that causes these neutrophiles to reproduce and grow in the bone marrow is a question which has not been answered. We have in liver extract, and other organ extracts, a factor which will cause the erythrocytes to reproduce and grow normally, but a similar factor to affect the neutrophiles in a similar way is yet to be isolated. This factor would be termed a maturation factor.

After the neutrophiles have reproduced and grown to maturity some stimulus causes them to come to the circulating blood. Of the many substances that have been shown to call the neutrophiles from the bone marrow, nucleic acid is most likely to be a part of the normal mechanism. As the worn out neutrophiles in the blood stream break down and disintegrate they liberate nucleic acid (which is their normal constituent) which in turn stimulates the outpouring of more neutrophiles. It is a question of demand and supply.

The normal procedure in the body is for new cells to constantly replace the worn-out cells. If the replacement cells are destroyed, or their development ceases, the supply cannot meet the demand. Also, when the number of these cells is greatly diminished in the blood stream there would be less neucleic acid to stimulate the outpouring of more cells even though there were a normal supply of replacement cells. Therefore, three factors may be responsible for neutropenia: lack of parent cells, replacement cells in the bone marrow (destroyed, as by drugs, roentgen ray, etc.); their inability to maturate properly (cause unknown); lack of a factor to bring the cells to the circulating blood.

The chief symptoms of neutropenia are extreme fatigue, malaise, drowsiness, sore throat, sore mouth and adenitis. The fatigue and malaise may have been present for some weeks prior to the other symptoms. These patients have often been diagnosed as having diphtheria, streptococcic sore throat or trench mouth. Any patient presenting the symptoms of sore throat or sore mouth, and septic and toxic symptoms out of all proportion to the local lesions should have a total leukocyte count and differential leukocyte count so that neutropenia may be ruled out. The onset of this syndrome may be with chill and fever, the temperature usually being around 101° F. These patients often give a history of weakness or lack of vitality for varying periods before the onset of the condition. The sore throat may be absent, and only fatigue, malaise and drowsiness to suggest the necessity of a blood study. Local lesions such as sore throat, ulcers of mouth or throat, gingivitis, ulcers of vagina, rectum, anus or skin usually appear as late lesions, or after the neutropenia has been present for a few days.

A brief illustration of a typical history of a fulminating neutropenia would be as follows: For four days an apparently strong and healthy patient of middle age feels sluggish and tires very easily; the fifth day has a slight chill and fever; the sixth day, a higher fever and drowsy feeling; the seventh day, a slight redness of the throat and a restless stupor; the eighth day, coma and death. Aside from these signs and symptoms, all findings are negative except an absence of neutrophiles in the blood stream.

A patient with chronic neutropenia may present only the symptoms of weakness and easy fatigue. These patients may develop an acute attack at any time.

The diagnosis must be made early if the mortality is to be reduced, and it must therefore be made on the more vague symptoms of weakness, lack of vitality, easy fatigue, malaise and drowsiness, which symptoms should be checked by a total leukocyte and differential leukocyte count. In a typical well-developed case the diagnosis is easy if the blood studies are accurately interpreted. The condition is occasionally confused with acute leukopenic lymphatic leukemia, chronic leukemia with low values for leukocytes, generalized sarcomatosis with involvement of the bone marrow, aplastic anemia, sepsis, and infectious mononucleosis. Repeated blood studies are essential, both for diagnosis and prognosis. It is probable that many cases with characteristics of neutropenia are overlooked because of inadequate laboratory studies. It must be emphasized that one blood study is not sufficient. Daily counts, or counts twice daily, may be necessary to establish the diagnosis. A patient with a total count of 3,500 or 4,000, and 50 per cent or less of neutrophiles, should be watched carefully and checked frequently.

The total number of leukocytes in a case of neutropenia may be as low as 250 per cu. mm. The percentage of neutrophiles may be from 40 per cent

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down to 10 or 5 per cent, or they may be completely absent. A careful study of the blood smears as to the percentage of myelocytes, mature or immature, myeloblasts and endothelial leukocytes is essential. In typical cases of neutropenia the erythrocytes, hemoglobin and platelets are not affected. Of course, a patient may have had an anemia preceding the attack of neutropenia, in which case it cannot be said to be a part of the syndrome. The chief blood picture is the low total leukocyte count and the low percentage of neutrophiles.

There isn't any pathology characteristic of neutropenia except possibly in the bone marrow. The myeloid tissue may be aplastic, normal or hyperplastic. Neutropenia due to roentgen rays, radium, drugs such as benzene, arsphenamine, etc., show hypoplastic or aplastic myeloid tissue. Lesions developing in the mouth, throat, rectum, skin, etc., show necrosis without inflammatory reaction. The spleen may be enlarged, but the pathology in the spleen, when present, is dependent on the predominance of toxic or septic symptoms and not characteristic of the neutropenic state. Cultures and direct smears from the local lesions may show any organisms that happen to be in that locality and may be considered incidental and secondary.

The etiology of neutropenia has been a matter of speculation since 1922. Predisposing causes mentioned are: certain infections and toxins, drugs and chemicals containing the benzene ring, the arsenicals, mesothorium, trinitrotoluene, roentgen rays, and the gamma rays of radium.

Extensive search for an organism which causes a depressant effect on the bone marrow and capable of producing a typical neutropenia has met with little success. Various organisms have been isolated from the blood stream and local lesions of patients suffering with neutropenia. No one organism occurs constantly or even frequently in these cases and when present may be considered incidental and secondary and due to the fact that the protective mechanism of the body, inherent in the neutrophiles, is lost. These organisms have been injected into animals and some of these animals developed leukopenia and neutropenia, but not in a manner entirely comparable to the syndrome seen in human beings. The reaction was more like that of an overwhelming infection.

Dennis[3] thought that focal infections might produce neutropenia. In his experimental work he introduced into rabbits various organisms in a manner intended to simulate a focal infection. Some of the animals developed a leukopenia and neutropenia, but here again the results were more like an overwhelming infection. Focal infections have existed throughout the human era and it does not seem likely that they alone could explain a clinical syndrome which apparently is of very recent appearance. Also, if focal infections were the explanation, it would seem that neutropenia would be of much more frequent occurrence.

There are now over forty cases of neutropenia reported in the literature that followed the administration of arsphenamine. Arsphenamine contains the benzene ring and it is now thought that this benzene ring may be responsible for the neutropenia. It has been known for many years that benzene was a powerful leukocytic depressant. Benzene has been given experimentally to animals and a neutropenia produced.[4]

In my review of benign and malignant neutropenia, published in 1933,[5] and which was written about two years before it was published, I made the following statement: "Since it is known that benzene is a powerful leukocytic depressant and taking into consideration the thirty-nine cases following the use of arsphenamine, it might be possible that any drug containing the benzene ring could be an etiologic factor, such as the many coal tar derivatives on the market which are used by the public indiscriminately. These drugs may serve to weaken the hematopoietic tissue."

The principal drugs containing the benzene ring which are extensively used are the coal tar derivatives, the hypnotics and the drugs used to relieve pain, such as pyramidon (amidopyrine), alurate, sodium amytal, antipyrine, dial, allonal, luminal (phenobarbital) lumodrin, peralga, acetphenitidin, etc.

Kracke[4] observed that eight of nine patients with neutropenia seen by him had taken drugs of the coal tar series prior to the onset of their illness. In a more recent article, Kracke[6] brought out both experimental and clinical evidence to show the connection of these drugs with the neutropenic state. Madison and Squires[7] report on fourteen patients in each of whom the onset of neutropenia was directly preceded by the use of amidopyrine alone or

in combination with a barbiturate. Watkins,[8] at the Mayo Clinic, observed that the majority of his cases of neutropenia were preceded by the taking of either amidopyrine or a barbituric acid derivative. Watkins thinks that these patients have a primary dysfunction of the bone marrow. Randall[9] reports a case of neutropenia which followed the use of barbiturates and amidopyrine. The symptoms were manifest in just a few hours after taking these drugs. Hoffman and his co-workers,[10] in reporting fourteen cases of neutropenia which were preceded by the use of these coal tar drugs, report that one of the cases followed the taking of 100 mgs. of dinitrophenol four times a day for two weeks, which the patient took on her own behest for reduction purposes. This adds another drug to the list of myeloid depressants.

The period of rapid increase in the incidence of neutropenia coincides almost exactly with the increase in the use of drugs containing a combination of amidopyrine with a barbiturate. Also, the majority of cases of neutropenia are reported from Germany and the United States, the two countries in which these drugs are used most extensively. Another interesting observation in this connection is that this syndrome has appeared principally in those people who are most apt to be taking these drugs—physicians, physicians' wives, nurses and patients of physicians. In most instances it has occurred in individuals who have had some type of illness, usually associated with pain, and were under medical care prior to the onset of the neutropenia.

It therefore seems apparent that the bone marrow and blood changes in many cases of neutropenia are the result of the repeated administration of certain drugs containing the benzene ring to which the patient has developed a hypersensitivity. This type of neutropenia is then the result of an allergic or anaphylactoid drug reaction and it would then seem wise for all physicians to keep this type of drug idiosyncrasy in mind, and to restrict the use of amidopyrine alone, or in combination with other drugs, to patients who are in a position to have leukocyte counts several times a week.

At this point it might be well to speak of these drugs in connection with other diseases. We frequently see a patient with a severe infection and a leukocytosis, suddenly developing a leukopenia, and we assume that this is the patient's reaction to an overwhelming infection. In such cases the prognosis is grave. It would then seem wise to not administer these drugs of the coal tar series, known to be myeloid depressants, to patients with severe infections, as, if they have an idiosyncrasy for these drugs, they will be much more likely to develop this leukopenia.

There are some types of neutropenia, however, which are not due to this anaphylactoid drug reaction. I refer to the chronic, non-infectious deficiency neutropenias with moderate secondary anemia and thrombopenia. In these patients there is an intrinsic disorder of the bone marrow in which the neutrophiles do not properly maturate. The granular series of blood cells seem to be checked at the myeloblast-myelocyte stage in the myeloid tissue, supposedly caused by some maturation-inhibiting factor directed against the graular cell series. The author had the opportunity of studying such a case over a period of four years. The case ran a course similar in many ways to that of an untreated case of pernicious anemia, showing attacks and remissions of variable length, finally ending in death. At autopsy the bone marrow grossly looked like the pernicious anemia bone marrow, being reddish brown, very cellular and increased in amount. The granular cells were abundant, but maturation had ceased. In this case there was no history of drugs of the coal tar series or infections preceding the onset. In other words, the etiology in cases of this type is still unsolved.

Other suggestions as to etiology have been: allergy of undetermined origin; congenital and familial anomaly; paralysis of the bone marrow, and endogenous disturbance of production of chemotactic or maturation factors.

There are three main therapeutic measures used at this time: transfusions, irradiation of bones and the nucleic acid derivatives. Such therapeutic measures as fetal liver, extract of bone marrow, leukocytic extract, leukocytic cream, addison and liver extract have been used, but definite results from these agents have been lacking. In fact, until we can reproduce the very same condition in animals, we have no justification for saying that patients recover because of any particular type of therapy. We are sometimes led astray when the patient has recovered after a certain type of treatment. When daily blood smears are studied during an attack of neutropenia, the first change in the blood picture is a monocy-

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tosis before the neutrophiles appear in any number. Many patients show this monocytosis before therapy is instituted, showing that a spontaneous recovery or remission was beginning.

There is no specific treatment for the throat, mouth or other local lesions. Mercurochrome or arsenicals are contraindicated. The throat lesions should be treated conservatively with irrigations and an ice collar to the neck, if that gives comfort. It is a mistake to treat any of the local lesions drastically. If the blood picture returns to normal the lesions will tend to heal, and if the blood does not return to normal the patient will die.

Drugs of the coal tar series should never be administered for the purpose of relieving pain or producing sleep in patients having this neutropenic syndrome, because of their depressing effect upon the myeloid tissue in some patients.

Transfusions have not been shown to be of any specific value. They certainly are not indicated if the red cells are normal, and may do harm, as it had been shown that the bone marrow is depressed for sometime after the transfusion. Doan,[11] however, suggests exsanguination-transfusions in cases of neutropenia due to infection.

Roentgen ray, when effective, takes four or five days. If the patient is going to recover in that time they will do so spontaneously. Doan[11] concluded from his experimental work with roentgen rays on myelopoiesis, that a stimulatory dose shows some prior evidence of myelocytic destruction, and he therefore thinks that rotengen treatment is contraindicated whenever a hypoplastic myeloid marrow underlies a given neutropenic state. Therefore, according to Doan, it would not be wise to use roentgen ray treatment unless preceded by a biopsy of the bone marrow to determine whether it was hypoplastic, normal or hyperplastic.

Doan and his co-workers,[12] in their experimental work, found that the split products of nucleic acid, adenine and guanine, would call the neutrophiles from the myeloid tissue and produce a direct leukocytosis. Reznikoff,[13] in 1930, was the first to apply this knowledge clinically, in this syndrome. He reported the administration of adenine sulphate, a nucleic acid derivative, to patients with neutropenia. Jackson and his co-workers,[14] in 1931, reported the use of pentose nucleotide, also a nucleic acid derivative, in cases of neutropenia. Pentose nucleotide is now available commercially. Dameshek[15] thinks that adenine sulphate may possibly be the active principle of the pentose nucleotide.

The administration of pentose nucleotide occasionally gives quite severe reactions, while adenine sulphate is not so easy to administer, but does not give reactions and will give the same results as the pentose nucleotide. Dameshek[15] gives a report of a case of neutropenia treated with pentose nucleotide. The patient had extremely severe reactions during which the white cell count fell progressively to 500. When the more simple nucleic acid derivative, adenine sulphate, was given, no further reactions occurred and the patient showed rapid improvement. One gram of adenine sulphate is dissolved in 35 c.c. of normal saline by boiling. It is given intravenously, in a fairly warm state to prevent precipitation, every eight hours for at least ten doses.

Reich and Reich[16] studied the stimulating and maturative effect of injections of pentose nucleotide on the hematopoietic system of the rat, both with and without benzol depression. They found that injections of normal saline produced results not significantly different from those of the pentose nucleotide. They concluded that their practically negative experimental results cast some doubt on the value of pentose nucleotide in the treatment of neutropenia.

Pentose nucleotide and adenine sulphate have not been demonstrated to be specific. Until we can rule out spontaneous recovery, we have no right to claim specific treatment. However, the mortality rate is reported to be greatly reduced with these two forms of treatment. Some of this reduction in the mortality rate may be due to the fact that more cases are being recognized and diagnosed earlier than formerly; also, some cases may be definitely due to a lack of nucleic acid derivatives in the blood stream, in which case they would be receiving specific treatment.

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*1103 West Franklin Street.*

# Correspondence

## What is the Relation Between Influenza and Malaria?

AMELIA, VA., AUGUST 6, 1934.

TO THE EDITOR:

I read with much interest your article for October, 1932, on the work of Sir Ronald Ross with the malarial parasite. There is no doubt whatever that the anopheles mosquito is the infecting agent in malaria.

But our State Health Board has done virtually no anti-malarial work in Amelia County, Virginia. Amelia, along its streams and near its mill ponds, was up to 1918 a terribly malarial ridden section of the State.

At the beginning of the great influenza epidemic, the malaria disappeared almost completely. It is just beginning to appear again after a lapse of nearly sixteen years. Anti-mosquito work had nothing whatever to do with this decline of the incidence of malaria for practically no such work has been done in the County.

Influenza must have established an immunity against malaria among the people.

There is no other way to account for its disappearance. G. C. EGGLESTON, M. D.

## A Correction.

TO THE EDITOR:

In my discussion of the paper on "Endometriosis," by Dr. Goodwin, in the VIRGINIA MEDICAL MONTHLY, August, 1934, on the bottom of page 262, there is a typographical error in which the age of the patient is placed at 48 years, instead of 42 years as it should be.

The difference of six years in the latter part of menstrual life is rather important in this case, as the resection of the bowel was done in preference to the less serious operation of removing the ovaries, partly because the patient desired the preservation of ovarian function.

J. SHELTON HORSLEY, M. D.

Richmond, Va.
August 3, 1934.

# Public Health Statistics

I. C. RIGGIN, M. D.
*Health Commissioner of Virginia*

The communicable disease report received at the office of Dr. G. F. McGinnes, State Epidemiologist, during July, 1934, showed the following cases: Typhoid and Paratyphoid Fever, 120; Diphtheria, 40; Scarlet Fever, 67; Measles, 611; Meningitis, 3; Poliomyelitis, 4; Rocky Mountain Spotted Fever, 10; Typhus Fever, 1; Undulant Fever, 1.

Typhoid and Paratyphoid Fever was reported from 46 counties and 9 cities.

The cases of Diphtheria were scattered in 24 counties and 4 cities.

Scarlet Fever cases were reported from 22 counties and 7 cities.

The cases of Measles were scattered in 53 counties and 7 cities.

Epidemic Meningitis was reported from: King George, 1; Nelson, 1; Tazewell, 1.

Poliomyelitis was reported from: Bland, 1; Middlesex, 1; Nottoway, 1; Rockingham, 1.

Rocky Mountain Spotted Fever was reported from the following counties: Albemarle, 1; Caroline, 1; Charlotte, 1; Hanover, 1; Henrico, 1; Prince William, 2; Rockbridge, 2; Surry, 1.

Typhus Fever case was reported from Warren County.

Undulant Fever case was reported from Rockingham County.

XUM

### DABNEY'S GRIPPE

Approximately 940 cases of so-called Dabney's Grippe have been reported to the State Department of Health from July 1st to August 15th of this year. Thus far, there have been no known deaths. Dabney's Grippe is also known as Epidemic Pleurodynia, Epidemic Transient Diaphragmatic Spasm, and Devil's Grippe. As this is a disease which is not required to be reported to the State, it is believed that there are many more cases existing than there are on record at this time. Many physicians have written to the Department describing what is undoubtedly Dabney's Grippe, and requesting information. As far as can be ascertained, this disease was first reported by Dr. William C. Dabney in 1888.* It was not discussed again until 1923, when in August about 700 cases were reported to the State Department of Health of Virginia with three deaths. It was then described by Drs. Payne and Armstrong.† Sixteen cases of an unknown disease were reported at the Presbyterian Hospital in New York City in June, 1923, with the statement that there were many cases with the same syndrome along the shores of New Jersey.

The characteristic features of the malady seem to be:

1. Sudden onset.

2. Pain referred to the chest or upper abdomen with tenderness along lower ribs, and dyspnea.

3. A rather high fever with a few other general symptoms.

4. A disappearance of pain and fever within twenty-four hours with frequent recurrence on third or fourth day after onset.

5. Speedy recovery.

6. Children are somewhat more frequently attacked than adults.

7. Most cases occur in the summer months.

8. Disease believed to be of an infectious nature (secondary cases within a family are very frequent within a short space of time).

9. Occurs primarily in rural districts.

Prodromal symptoms are usually absent. In fact the patients frequently say that they are feeling well immediately before the onset. Usually patients are able to recall the precise time of the beginning of the pain which is without exception the initial symptom, and which appears without any previous warning. The pain may appear in the lower anterior chest or in the upper mid-epigastrium and each paroxysm is usually sharp and aggravated by deep respiration or by bodily movements. Pain has been synchronous with that of the temperature which may go to 103°, lasting from four to ten hours. As the temperature falls the pain subsides and the patient becomes more comfortable. With the rising temperature there is usually profuse perspiration. The cases of abdominal pain show considerable stiffness of the upper abdomen and differential diagnosis from acute appendicitis is somewhat difficult. Constipation is the rule and most cases complain of headache. There is no cough, coryza, sore throat or expectoration. Lungs always seem clear and friction rub cannot be heard.

Treatment is expectant.

*Dabney, William C. An Account of an Epidemic Resembling Dengue, Which Occurred in and Around Charlottesville and the University of Virginia, in June, 1888, *American Journal of the Medical Sciences*, 1888, Vol. 96, pp. 488-494.

†A Disease of Unknown Etiology, Epidemic in Virginia in 1888 and 1923, Giving Symptoms of Transient Diaphragmatic Spasm, by Drs. George C. Payne and Charles Armstrong. *Journal A. M. A.*, Vol. 81, No. 9, September 1, 1923, pp. 746-748.

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# Woman's Auxiliary
## to the
# Medical Society of Va.

*President*—MRS. WILLIAM LETT HARRIS, 1112 Matoaka Street, Norfolk.

*President-Elect*—MRS. JOSEPH BEAR, 3012 Monument Avenue, Richmond.

*Recording Secretary*—MRS. FLETCHER J. WRIGHT, 49 South Market Street, Petersburg.

*Corresponding Secretary*—MRS. CHARLES A. SAUNDERS, 1000 Gates Avenue, Norfolk.

*Treasurer*—MRS. REUBEN F. SIMMS, 2034 Park Avenue, Richmond.

### Invitation to Alexandria.

The Woman's Auxiliary to the Alexandria Medical Society extends a most cordial invitation to all members of the Woman's Auxiliary and to the wives and daughters of the members of the Medical Society of Virginia, to attend the annual meeting to

be held in Alexandria on October 9th, 10th and 11th.

Alexandria is centrally located, with good roads in all directions, several railroads, and is of easy access.

Our plans are for your entertainment and we are looking forward with great pleasure to your coming.

Sincerely yours,

ELLEN HALL HORNTHAL
(MRS. HENRY A. HORNTHAL)
*Secretary, Woman's Auxiliary.*
*Alexandria Medical Society.*

P. S. Please, Doctor, be sure to take at least this copy of the MONTHLY home to your wife.

## Preliminary News of the 12th Annual Meeting of the Woman's Auxiliary in Alexandria, Virginia.

The Annual Convention fills three important phases in Auxiliary life; it is the crowning event of the year's activities, when the County Auxiliaries gather together the fruits of their labor and present them as a whole to the Medical Society of the State and to its Auxiliary; it marks the glorious beginning of a new year and gives to Auxiliary work a fresh inspiration; it is also the play-time of the Auxiliary, when, by making and renewing friendships in a delightful manner the opportunity is given to more advantageously promote the advancement of health throughout the State.

I urge not only Auxiliary members, but all who are eligible for membership to avail themselves of the privilege of attending this Convention, October 9th, 10th and 11th.

On Wednesday, October 10th, all Auxiliary business meetings will be conducted. The day will begin with the Pre-Convention Board Meeting being held at a breakfast (subscription). Later in the morning at the General Auxiliary meeting all reports for the year will be given. There will be an Auxiliary Luncheon (subscription), during which interesting addresses will be made and a short round-table discussion of Auxiliary problems held. After this, the installation of the new officers will create a fitting climax to an interesting program.

Every woman attending the Convention is cordially invited to the General Meetings and to the Auxiliary Luncheon. Members are urged to be present.

We anticipate the honor of including among our guests; the President of the Auxiliary to the American Medical Association, Mrs. Robert W. Tomlinson, Wilmington, Del.; the President of the Auxiliary to the Southern Medical Association, Mrs. Southgate Leigh, Norfolk, Virginia, who is also a member; members of the Auxiliary to the District of Columbia; also the President of the Medical Society of Virginia, Dr. R. D. Bates, Newtown; the President-Elect, Dr. F. H. Smith, Abingdon; and the members of our Advisory Council, and other distinguished guests.

The hostess Auxiliary is planning a very delightful program of entertainment.

A complete program with the announcement of the Post-Convention Board meeting will be published in the October issue of the Journal.

GERTRUDE M. BURGES HARRIS,
MRS. WILLIAM LETT HARRIS,
*President.*

## The Woman's Auxiliary of the Mid-Tidewater Medical Society

Met at the Country Club of Gloucester C. H., on July 24th. The president, Mrs. Hawes Campbell, Enfield, presided and opened the meeting with prayer. Guest speakers at the meeting were Mrs. Lee E. Sutton and Mrs. Reuben F. Simms, of Richmond, who gave interesting talks on organization and the treasurer's work.

The following committee chairmen were appointed: Social, Mrs. M. H. Harris, West Point; Philanthropic, Mrs. Wm. Gwathmey, Ruark; Legislative, Mrs. J. W. Smith, Hayes Store; Educational, Mrs. Hawes Campbell, Jr., Hanover; Public Relations, Mrs. Clarence Campbell, Sparta; Historian, Mrs. Horace Hoskins, Saluda; County, Mrs. James D. Clements, Ordinary.

After adjournment, this group was delightfully entertained at a luncheon by Dr. H. A. Tabb, Gloucester, and later enjoyed a trip to White Marsh, to the home of Mr. Baruch.

XUM

# Alexandria—

## Our Convention City

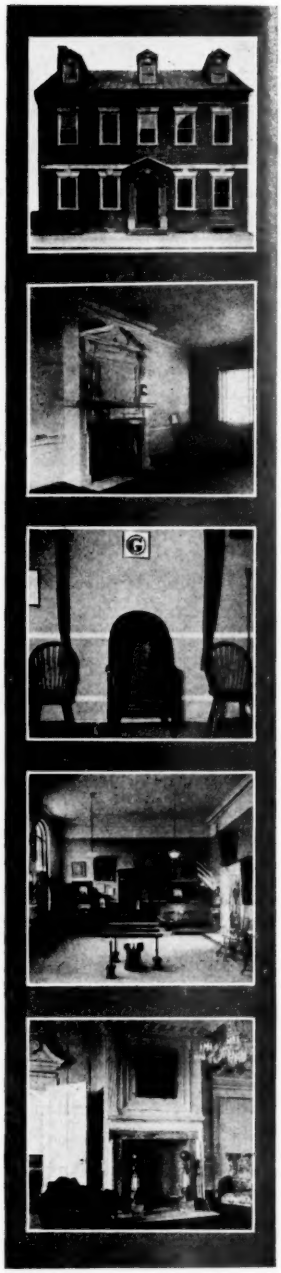
### When You Come to Alexandria

In October, 1934, for the first time in over fifty years, the Medical Society of Virginia will meet in Alexandria, and her historic doors stand open wide in welcome.

There are many interesting old homes and buildings which you will want to see and, as all of the historically famous spots are in the old section of the city within a few blocks of one another, one or two spare hours will see you through all of them.

Gadsby's Tavern should be on every sightseeing list. The ballroom and beautiful doorway of this building are now in the Metropolitan Museum of Art in New York City. The rest of the building is intact and has been restored by various patriotic societies and citizens of the town who wish to keep Alexandria as she was, a city of personality. Here, at Gadsby's, in 1778, John Paul Jones found LaFayette and Baron de Kalb vainly trying to communicate their wants to the hostlers. Jones stepped in and interpreted for them and there, on the cobblestones of the stableyard, a life-long friendship was established. Gadsby's Tavern is completely furnished today with the beautiful and authentic early American furniture of the Henderson collection. This should be of interest especially to the ladies of the Medical Society Auxiliary for what modern housewife does not thrill at a display of "antiques"? And the gentlemen of the convention would surely be interested in the bar, an exact reproduction of the bars of the period, with its display of bottles and jugs! Many social festivities occurred at Gadsby's and great personages of the country lodged there. Ann Warren, the celebrated actress, died there and was buried in Christ Church yard. The mystery of Gadsby's, and all interesting places have mysteries, was the illness and death of "The Female Stranger." She arrived in the company of her husband and soon after coming died of typhoid. Neither she nor her husband ever divulged their names or past. She was buried in St. Paul's cemetery and the name on her tombstone is—"A Female Stranger."

The Alexandria-Washington Lodge of Masons keeps its lodge rooms open to the public and is well worth visiting. George Washington was made Master of this Lodge in 1788, and the Lodge Museum contains the great chair from which he presided and the famous Williams' portrait which was approved by Washington himself as his best likeness. Here you may see the little silver trowel which was used in laying the



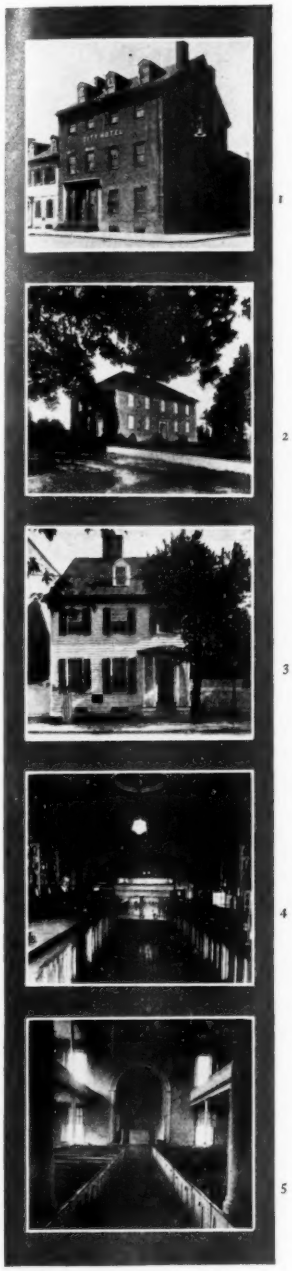
1—Gadsby's Tavern.

2—Another View of Gadsby's Tavern.

3—Masonic Lodge.

4—Another View of Masonic Lodge.

5—Carlyle House.



1—Old City Hotel.

2—Pohick Church.

3—Home of Dr. Brown.

4—Interior Leadbeater's Drug Store.

5—Old Presbyterian Meeting House.

cornerstones of the Capitol of the United States, the Smithsonian Institute, the Washington Monument, and George Washington Masonic National Memorial. The oil paintings hung on the walls of the lodge room were done by such masters as Reynolds, Peale, and many others. Dr. Dick's dueling pistols are here on display. (The Dr. Dick who tended Washington in his last illness.) The doctor, when he turned from The Church of England and became a Quaker, went down to the river and tossed his pistols into the water as testimony of his sincerity. Some admirer, as soon as the doctor's back was turned, dived in and brought them up, and they finally came to be the property of the Lodge.

Leadbeater's Drug Store should have special appeal to the medical profession. Founded by Edward Stabler in 1792, it is the oldest drug store in Virginia and the second oldest in the country. Behind its counters prescriptions were compounded for the Washingtons and Lees, Henry Clay, John Calhoun, Daniel Webster and many others famed in American history. In the old records are many items of interest, one being an order signed by Martha Washington for a certain amount of castor oil. The store is now being restored by the Landmarks Society of Alexandria.

See Christ Church where Washington and Lee worshipped and the old Presbyterian Meeting House in whose churchyard lies the Unknown Soldier of the American Revolution. Dr. James Craik is also buried here. The organ in this church is probably the oldest pipe organ in America in point of service. It is still being used.

When you go to the Carlyle House where the ghosts of early America rustle, be sure to see the wine cellars and dungeons under the building. In this home Washington, George Mason, James Rumsey, of steamboat fame, Thomas Jefferson, Aaron Burr, John Marshall, John Paul Jones, Charles Carroll, of Carrolton, and many others were entertained.

Towering over Alexandria and visible from almost every section of the city is the George Washington Masonic National Memorial. It is not yet completed but is open to the public.

Just eight miles down the beautiful Mount Vernon Memorial Boulevard is the home of the Washingtons which every Virginian knows, but the road is new, following the bends and curves of the Potomac, and is something you should not miss.

And of the newer side of Alexandria—the hotels and tearooms are prepared to put forth their noblest menus for the convention, and a game of golf can be had at the Belle Haven Golf and Country Club.

Alexandria waits to greet you every one!

# PROGRAM

## MEDICAL SOCIETY OF VIRGINIA

### Sixty-fifth Annual Session

### Alexandria, Virginia

### OCTOBER 9, 10 and 11, 1934

THE GEORGE MASON — *Hotel Headquarters*

## SCIENTIFIC PROGRAM

### CLINICS

**Tuesday, October 9**
**4:00 to 6:00 P. M.**

**Thursday, October 11**
**3:00 to 5:00 P. M.**

### GENERAL SESSIONS

**Tuesday, October 9**
**8:00 P. M.**
**Elks Hall**

Call to Order—S. B. MOORE, M. D., Chairman, Committee of Arrangements.

Invocation.

Announcements.

Address of President—ROBLEY DUNGLISON BATES, M. D., Newtown.

Memorial Hour.

Address—The General Practitioner's Interest in Rectal Diseases.

HARVEY B. STONE, M. D., Baltimore (Guest).

**Wednesday, October 10**
**9:00 A. M.**
**Medical and Surgical Sections**

### Medical Section—Westminister Building

The Treatment of Obesity.

HARRY WALKER, M. D., Richmond.

Reports several cases in which good results have been obtained by use of diet and thyroid extract. Discusses indications for treatment in obesity and reviews newer drugs advised for condition.

Discussion opened by WILLIAM B. PORTER, M. D., Richmond.

Medico-Legal Aspects of Apoplexy.

J. MORRISON HUTCHESON, M. D., Richmond.

As textbooks generally state apoplexy results from bodily stress, the question of accidental cause is important in persons with accident insurance or beneficiaries of Workmen's Compensation. The nature of apoplexy is discussed and illustrative cases presented.

Discussion opened by BEVERLEY R. TUCKER, M. D., Richmond.

A Study of Convulsive Disorders at the University of Virginia Hospital since 1920.

FRANK A. STRICKLER, M. D., University.

By repeated investigations and close follow-ups many patients living outside institutions and continuing their contacts with ordinary life are described. Value of encephalography in diagnosis and treatment is stressed.

The Irritable Colon: A Common Condition, Commonly Misunderstood.

DEWEY DAVIS, M. D., Richmond.

Chronic irritability of colon is usually of neurogenic origin, occurring in vagotonic type of individual. Complete study of physical and nervous makeup and survey of environment necessary in each case. Medical treatment properly administered usually gives satisfactory results.

Discussion opened by OSCAR L. HITE, M. D., Richmond.

Drug Idiosyncrasy and Neutropenia.

REGENA C. BECK, M. D., Richmond.

This paper discusses all drugs known to produce neutropenia. Experimental evidence and clinical data are given.

Discussion opened by HARVEY B. HAAG, M. D., Richmond.

Total Thyroidectomy for Chronic Heart Failure.

DOUGLAS G. CHAPMAN, M. D., Richmond.

Brief review of literature with summary of indications and contra-indications for operation. Mechanism by which heart is relieved through operation is discussed. Case reported and technic described.

Discussion opened by KINLOCH NELSON, M. D., Richmond.

The Diagnosis of Rocky Mountain Spotted Fever of the Eastern Type.

H. B. MULHOLLAND, M. D., University.

A review of the varying clinical manifestations of Rocky Mountain Spotted Fever, Eastern Type, as observed in six cases this summer. Also review of autopsy material.

Discussion opened by KENNETH MANCY, M. D., University.

### Surgical Section—Young Peoples Building

Wandering Spleen with Torsion of Its Pedicle: Report of a Case.

J. COLEMAN MOTLEY, M. D., Abingdon.

Case in eight-year-old boy reported because of rarity of condition. Discusses symptoms, diagnosis, treatment and pathology. Reviews literature and gives bibliography of reported cases.

Discussion opened by FRANK S. JOHNS, M. D., Richmond.

Leiomyoma of the Gastro-Intestinal Tract, with Presentation of Two Cases.

R. DUVAL JONES, JR., M. D., Norfolk.

An unusual lesion which may explain hemorrhage or intermittent obstruction of intestines. Pathogenesis uncertain though usually benign. Most frequently occurs in stomach. Diagnosis is by X-ray and treatment surgical.

Discussion opened by CARRINGTON WILLIAMS, M. D., Richmond.

The Cure of Direct Inguinal Hernia (*Illustrated*).

CHARLES R. ROBINS, M. D., Richmond.

The frequent recurrence of hernia following operation seems to persist notwithstanding the numerous operations devised. This suggests a common cause which it is the object of this paper to investigate.

Discussion opened by ROBERT L. PAYNE, M. D., Norfolk.

Further Observations in the Treatment of Acute Head Injuries.

C. C. COLEMAN, M. D., Richmond.

W. G. CRUTCHFIELD, M. D., Richmond.

Importance of viewing every acute head injury as possibly associated with damage to brain. Fracture of skull an uncertain guide. Importance of lacerations of scalp and early adequate treatment based upon pathologic conceptions.

Discussion opened by EDWIN P. LEHMAN, M. D., University.

Fifteen Hundred Spinal Anesthesias with Special Reference to Indications, Complications and Mortality.

J. M. EMMETT, M. D., Clifton Forge.

Review of clinical indications for use of spinal anethesia with discussion of its advantages and disadvantages. Technical safeguards surrounding its use with detailed report of mortalities and operative classification of conditions for which used.

Discussion opened by I. A. BIGGER, M. D., Richmond.

Surgical Treatment of 183 Consecutive Thyroid Cases with No Mortality.

GUY HORSLEY, M. D., Richmond.

This is a review of 183 consecutive thyroid cases treated at St. Elizabeth's Hospital during the past ten years with no mortality. The pre- and post-operative treatment used is given

Discussion opened by C. BRUCE MORTON, M. D., University.

EVIPAL ANESTHESIA.

CHARLES S. WHITE, M. D., Washington, D. C.

J. LLOYD COLLINS, M. D., Washington, D. C.

The advantages, technique of administration, reactions and types of operations in which evipal has been used will be dealt with. Covers an experience with 150 cases.

Discussion opened by J. SHELTON HORSLEY, M. D., Richmond.

## Wednesday, 3:00 P. M.
## Westminister Building

Problems in Breast Feeding.

JOHN S. WEITZEL, M. D., Richmond.

The great percentage of mothers unable to supply the proper quality or quantity of breast milk is cited and an attempt made to locate the causative factor. A detailed discussion of the anatomic, histologic and economic phases of the problem is given.

Discussion opened by THOMAS D. JONES, M. D., Richmond.

Gas Bacillus Infections: A Study of the Incidence, Treatment, and Mortality (*Illustrated*).

H. J. WARTHEN, M. D., Richmond.

An analysis of thirty-five cases of gas bacillus infection treated in the Medical College of Virginia hospitals, with special reference to the use of gas gangrene antitoxin.

Discussion opened by H. B. HOLSINGER, M. D., Farmville.

### Symposium on Medical Economics

Medical Education, Specialization, and the Private Practitioner.

J. C. FLIPPIN, M. D., University.

Insurance, Hospital and Sickness.

WALTER B. MARTIN, M. D., Norfolk.

Federal, State, County and Municipal Relations to Medicine and the Care of the Indigent Sick.

I. C. RIGGIN, M. D., Richmond.

General View of the Whole Program.

EDGAR SYDENSTRICKER, Director, Public Health Activities, Milbank Memorial Fund (Guest).

Discussion to be opened by W. L. POWELL, M. D., Roanoke.

## Wednesday, 8:00 P. M.
## Westminister Building

Colles' Fracture (*Illustrated*).

M. H. TODD, M. D., Norfolk.

After adequate reduction there is no special tendency to displacement. Splintage should permit free motion and light usage of fingers and thumb from first. Palmar displacement of ulna should be corrected. Splintage should be frequently inspected.

Discussion opened by H. PAGE MAUCK, M. D., Richmond.

Experience with an Efficient Method of Operation for Hemorrhoids, Adapted to General Practice in Rural Districts.

J. H. HIDEN, M. D., Pungoteague.

Operation adapted to defeat the quack in this field, meet economic necessities, simplify a radical removal with a new technique, easily carried out with relative safety and with least discomfort to the patient.

Discussion opened by H. L. DENOON, M. D., Nassawadox.

The Neuropathology of Pellagra in Its Relation to the Cutaneous and Other Manifestations.

BEVERLEY R. TUCKER, M. D., Richmond.

This paper deals with the examination of brains, cords, and sympathetic ganglia of pellagra patients and points toward the possibility of pellagra being due to a virus infection rather than dietary deficiency.

Discussion opened by S. D. BLACKFORD, M. D., University.

XUM

The Cystic Kidney (*Illustrated*).

JOSEPH F. GEISINGER, M. D., Richmond.

Consideration of the nature, characteristics, clinical picture and treatment of true renal cystic disease, with brief reports of eight cases illustrating various types.

Discussion opened by LINWOOD D. KEYSER, M. D., Roanoke.

Brain Tumors in Children (*Illustrated*).

J. G. LYERLY, M. D., Richmond.

Early symptoms and signs of some of most frequent types of intracranial tumors are emphasized, and some of more frequent pathological types of tumor found in children are discussed with report of illustrative cases.

Discussion opened by HOWARD R. MASTERS, M. D., Richmond.

## Thursday, October 11
## 9:00 A. M.
## Westminister Building

Anemias Dependent upon Food Deficiencies.

JAMES P. BAKER, M. D., Richmond.

A concept of pernicious anemia, sprue, idiopathic hypochromic anemia and other anemias as being dependent upon deficiencies of intake, metabolism or absorption.

Discussion opened by WILLIAM H. HIGGINS, M. D., Richmond.

Some Extra-uterine Complications of Pregnancy.

H. HUDNALL WARE, M. D., Richmond.

A review of the diagnosis and treatment of some complications of pregnancy, including cases with acute infections, thyroid dysfunction and complications requiring surgical intervention.

Discussion opened by GREER BAUGHMAN, M. D., Richmond.

Venous Pressure and Body Weight Determinations in Congestive Heart Failure (*Illustrated*).

J. EDWIN WOOD, M. D., University.
GEO. D. CAPACCIO, M. D., University.
WILLIAM WEAVER, M. D., University.

Venous pressure values, their significance in cardiac failure, application of this method, and importance of body weight determinations in the treatment of any case of congestive heart failure are discussed.

Discussion opened by ALEX. F. ROBERTSON, JR., M. D., Staunton.

Pathological Lesions Correctly Diagnosis by Roentgenologic Methods and Later Missed at Surgical Exploration.

CLAUDE MOORE, M. D., Washington, D. C.

It is becoming evident that surgical exploration will not disclose all pathologic lesions found by the radiologist unless the viscus is opened and the mucosa actually inspected.

Discussion opened by C. BRUCE MORTON, M. D., University.

Vomiting in the Newborn, with Special Reference to Congenital Occlusion of the Duodenum: Report of Two Cases.

THOMAS D. WALKER, JR., M. D., Newport News.
W. W. FALKENER, M. D., Newport News.
J. SHELTON HORSLEY, M. D., Richmond.

The importance of prompt surgical intervention is stressed in cases requiring differentiation between congenital stenosis of the pylorus and congenital obstruction of the duodenum.

Discussion opened by W. P. MCDOWELL, M. D., Norfolk.

Collapse Therapy in Pulmonary Tuberculosis (*Illustrated*).

J. B. NICHOLLS, M. D., Catawba Sanatorium.
L. R. BROOME, M. D., Catawba Sanatorium.

Discusses technic and results of artificial pneumothorax, with internal pneumolysis as an aid. Considers selection of cases for phrenicotomy and recent improvements in and indications for thoracoplasty.

Discussion opened by E. C. DRASH, M. D., University.

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## ANNOUNCEMENTS

### Registration and Information Bureau
### Hotel George Mason

Dues may be paid at Registrar's desk. Please advise Registrar of any change of address.

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### SCIENTIFIC SESSIONS

Elks Hall—318 Prince Street.

Westminister Building—St Asaph and Prince Streets.

Young People's Building—Opposite George Mason Hotel.

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### BUSINESS SESSIONS

*Council*—Tuesday, October 9, at 11:00 A. M., in Room 316, George Mason Hotel.

*House of Delegates*—Tuesday, October 9, at 1:45 P. M., Small Dining-room, George Mason Hotel.

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### EXHIBITS

*Scientific*—Public Service Building.

*Commercial*—George Mason Hotel.

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### GOLF TOURNAMENT

Tuesday, October 9. Players are asked to bring their State or Club handicaps.

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### WOMAN'S AUXILIARY

Belle Haven Country Club.

# Proposed Changes in Constitution

As there is need of a new supply of copies of the Constitution and By-Laws of the Medical Society of Virginia, our President, Dr. R. D. Bates, recently appointed a committee composed of Dr. P. St. L. Moncure, Dr. J. Allison Hodges and Dr. J. C. Flippin to decide upon amendments they thought would be practical, that they might be presented to the House of Delegates at our Alexandria meeting. As it is necessary that amendments to the Constitution shall be published in the official publication of the Society at least a month before the annual meeting, we give amendments offered by the Committee. The words or sentences in brackets indicate omissions from the old Articles of the Constitution and italics indicate additions or new words suggested. If members desire copies of the Constitution now in use, they may be had upon request.

No change in Articles I, II, III and IV.

Article V. HOUSE OF DELEGATES

The House of Delegates shall be the business and legislative body of the Society, and its membership shall consist of the delegates elected by the component societies, the President, the President-elect and (ex-officio) the (ten) members of the Council. (The Executive Secretary-Treasurer of the Society shall be an ex-officio member.)*

(A report of the transactions of the House of Delegates shall be received at a general meeting of the Society before the close of the annual session).*

Article VI. COUNCIL

The Council shall have charge of the business affairs of the Society when the House of Delegates is not in session, and shall preparae and present a budget for the ensuing year to the House of Delegates at its first session. The Council shall consist of one member from each Congressional District of the State, together with the President and President-elect. (The Executive Secretary-Treasurer of the Society shall be an ex-officio member of the Council.)*

Article VII. OFFICERS

The officers of the Society shall be a President, a President-elect who shall succeed to the Presidency (at the end of the term) *the following year*, three Vice-Presidents, and the Executive Secretary-Treasurer. The office of the Executive Secretary-Treasurer may be held by a non-member.

The officers shall be elected during the annual session of the House of Delegates, and will begin service at the adjournment of the annual session and continue until the end of (the) *that* term, or until a successor qualifies. The term of office shall be for one year.

Article VIII. STANDING COMMITTEES

The Standing Committees of the Society shall be: [ (1) Scientific Work and Clinics; (2) Legislation and Public Health; (3) Publication and Program; (4) Medical Economics; (5) Medical Education and Hospitals; (6) Membership and (7) Ethics and Judiciary.] (1) *Publication and Program;* (2) *Scientific Exhibits and Clinics;* (3) *Department of Clinical and Medical Education;* (4) *Legislation;* (5) *Medical Economics;* (6) *Membership;* (7) *Ethics.*

Article IX. TRUST FUND FOR POST-GRADUATE CLINICAL EDUCATION

The last five living ex-presidents shall constitute a special committee to collect and hold in trust the post-graduate fund of the Society. *The retiring president shall be chairman.*

Article X. ANNUAL SESSION

There shall be an annual session of the Society and the date and place of the meeting shall be determined by the House of Delegates, *but at its discretion, these may be selected by the Council.*

No change in Articles XI, XII, XIII and XIV.

*Taken care of in By-Laws.

# Truth About Medicine

In addition to the articles previously enumerated, the following have been accepted by the Council on Pharmacy and Chemistry of the A. M. A.:

Carbide and Carbon Chemicals Corporation.
Triethanolamine-Carbide and Carbon Chemicals Corporation.

Lakeside Laboratories, Inc.
Ampoules Dextrose (d-Glucose) 50 Gm., 100 c.c.

Eli Lilly & Co.
Ampoules Glucose (Dextrose, U. S. P.) Lilly, Unbuffered, 25 Gm., 50 c.c.
Ampoules Glucose (Dextrose U. S. P.) Lilly, Buffered, 25 Gm., 50 c.c.
Ampoules Glucose (Dextrose, U. S. P.) Lilly, Unbuffered, 50 Gm., 100 c.c.

Sharp & Dohme, Inc.
Ivyol-Poison Ivy Extract-Mulford, one syringe package.

# Virginia Medical Monthly

Founded by LANDON B. EDWARDS, M. D., April, 1874
Owned by MEDICAL SOCIETY OF VIRGINIA since November, 1919
WYNDHAM B. BLANTON, M. D., *Editor*
AGNES V. EDWARDS, Richmond, *Business Manager*

PUBLICATION COMMITTEE
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All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Monthly, 1200 East Clay Street, Richmond, Va.

This journal is not responsible for the opinions and statements of its contributors.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance. Single Copies 25c.

VOLUME 61 SEPTEMBER, 1934 No. 6


# Editorial

## An Appraisal.

It has been recognized for a long time that the scientific output of medicine of the world today far surpasses the ability of any one person to grasp. It is safe to say also that much of what has been produced in the name of science is of ephemeral value and that no small part of it utlimately will prove to be grossly incorrect. It becomes important therefore to constantly sift the true from the false and to discover if possible what are the really worth while and lasting contributions to medicine in the age in which we live. The pursuit and mastery of these genuine advances will keep the average man more than busy thinking, reading and personally verifying.

With some such idea in mind we have collected and printed elsewhere in this number of the MONTHLY the opinions of several well-known American internists concerning what constitute the real strides of medicine within the past decade.

These opinions are of surprising unanimity. Most are agreed that the cure of pernicious anemia by liver therapy, and the new field that that discovery has opened up, represents the most noteworthy advance. Of hardly less importance is our increased and increasing knowledge of endocrinology—insulin, cortin, parathormone—as well as the newer knowledge concerning female sex hormonolgy. Toxoid in the prevention of diphtheria, the surgical treatment of pulmonary tuberculosis and the appreciation of the importance of vitamin factors in such diseases as pellagra constitute further evidence of recent lasting achievement in the large field of internal medicine.

## Infectious Pleurodynia.

In the November issue of the *American Journal of the Medical Sciences* for 1888, Professor William C. Dabney, of the University of Virginia, described for the first time a "new disease" under the title: *An Account of an Epidemic Resembling Dengue.* The epidemic prevailed in and around Charlottesville and at the University, and no less than fifty cases were observed. In discussing the disease, Dr. Dabney wrote:

> In every case which I saw the onset was *sudden* and usually violent. . . . The pain, however, was, by far, the most striking feature. . . . In character it was sharp and lancinating, and was much more violent when the patient attempted to move or to draw a deep breath. (So agonizing was this pain that it was nicknamed the "devil's grip" by a sufferer from the disease in Rappahannock County, Virginia, and this name became a common one there, afterward, as I was told by Dr. W. F. Cooper). . . . The pain was usually in the left side of the chest just below the nipple, but in some cases there was pain in the opposite side, or in the shoulder of the opposite side; and in a few cases, especially in children, there was pain in the abdomen, usually in the epigastric region. . . . *Headache* occurred in nearly every case and was usually severe. *Backache* was present in about half of the cases. The respirations were slightly increased in frequency in every case, and were rather shallow, but this increase seemed to be due entirely to the pain caused by drawing a deep breath. There was no cough, and no expectoration, nor were there any evidences of disease to be found on physical examination. . . . The digestive symptoms were, as a rule, not marked.

. . . There was more or less fever usually ranging from 102° to 104°. . . . I have already mentioned the most prominent of the cutaneous symptoms—the pungent heat of the skin."

In these words Dr. Dabney gave the first description of infectious pleurodynia, commonly called "devil's grip." At this time when an epidemic of some proportions has been reported from various parts of the state it is interesting to recall how the disease got its name and who first recognized it as a clinical entity.

**Where Practice Does Not Make Perfect.**

A grandmother ceases to worry over the parturient daughter who has passed safely through a first labor. As medical students we were assigned multiparae by preference and given certain freedom in their management under the assumption that it was safer for third and fourth year men to handle them than women in their first labor. It must come therefore as something of a surprise to the general run of practitioners to be told that the idea is fallacious that a primigravida implies a difficult labor and a multipara an easy one. Bethel Solomon punctures this belief in a contribution to a recent number of *The Lancet* by convincingly demonstrating that the mortality among multiparae is higher than it is among primigravidae. The reasons assigned for this surprising conclusion are (1) the grave obstetrical problem presented by the pendulous abdomen of women who have borne children; (2) the greater danger to them from eclampsia, probably incident to older kidneys; (3) the far greater frequency of accidental hemorrhage; (4) the much higher incidence of placenta praevia; (5) a peculiar liability to adherent placenta and ruptured uterus; (6) the likelihood that, in spite of a previous normal delivery, a multipara may develop complications incident to disparity in the size of the baby and the pelvic outlet; and finally (7) "failed forceps" which may occur whether a woman is in her first or a later pregnancy.

# Department of Clinical Education of the Medical Society of Virginia

**Obstetrical Program Draws to a Close.**

The Joint Committee on Prenatal and Postnatal Instruction, representing the three medical education agencies of the State was set up by the Medical Society of Virginia at Roanoke in 1931 as a subordinate branch of its Department of Clinical Education. Three annual appropriations unanimously voted by the Society amounting to a total of $6,000, and grants from the Commonwealth Fund of $15,000 have supplied most of the funds for this intensive program. Enrollment fees at five dollars per student were relied upon to complete the budget and meet about one-eighth of the cost. With this support fifty classes having a total membership of 594 physicians have already been held.

The third appropriation was made by the Medical Society at Lynchburg last fall with a view to continuing the program so that the opportunity of a class might be offered to every society which desired it. With the end of the tenth circuit in the week of September 10th, this phase of the educational program of the Medical Society of Virginia will come to a close.

The work has been successful beyond the highest anticipation of its proponents three years ago. The unanimous appropriations of funds by the Medical Society, the approval of fifty-four organized or especially formed medical groups in the State, the attendance rate of over 75 per cent on the part of members, and the written comment by over three hundred of the members that the course was well worth the cost in time and money as against six opinions to the contrary—all these are indications of the response to and effectiveness of the work. The credit for this success belongs largely to the Field Clinician, Dr. Maxwell E. Lapham, who has proved to be exactly the type of physician and teacher needed for this service.

HALF-WAY MARK IN THE TENTH CIRCUIT

The tenth and last circuit of courses in prenatal and postnatal instruction, with five meetings completed, has already a creditable record and a per-

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centage rate of enrolled members equal to the average of all the classes conducted. Thirty-six enrolled members and twenty-five visitors have attended the classes in Alexandria, Fairfax, Fredericksburg, Culpeper and Orange, with an average of 12.2 in attendance at each meeting. The percentage of attendance of enrolled members was 76.1.

OBSTETRICAL HISTORY CARDS ON HAND

When Dr. Lapham's classes are finished in September, there will be on hand several packages of obstetrical history cards like the ones distributed to members of the classes. Interested physicians may obtain limited supplies as long as they last from the Extension Division, Box 1487, University, Va. One evidence of interest in the courses in prenatal and postnatal care has been the continued requests for such materials from physicians who were enrolled in the classes.

**Experimental Pediatric Clinic.**

Because of the expressed desire for work in pediatrics by many of the physicians who were enrolled in the Joint Committee's courses, the Department of Clinical Education is trying to arrange at least one experimental short course during this Society year.

With the funds appropriated by the Medical Society at its last meeting for this purpose, and supplemented by other help, the Department of Clinical Education expects to offer a pediatric clinic in cooperation with one or two medical societies in the state during the first two weeks of September. Since the available resources are not enough to promote a statewide program now, the plan is to have one especially good two weeks' course under the instruction of the ablest clinician who can be found in the medical centers to the north and west.

It is hoped that this work may serve as a worthwhile demonstration of what can be done, and that interest will be stimulated to seek the means necessary for further work in this or other subjects which may appeal to the physicians of the state.

The entire course may be given in one center, or meetings may alternate between two centers. The subjects to be considered will be developed by the clinician in conjunction with the members of the groups. A nominal fee of two dollars will be charged for the entire course of ten meetings. Each meeting will be approximately two hours in length, the first hour for lectures and the second for clinical demonstrations and round-table discussions. In his out-of-class hours the clinician will be available for private consultations with enrolled members.

Plans for this pediatric clinic are rapidly taking shape, and it is hoped that the work may be successfully completed and a report of it submitted in the next issue of the MONTHLY.

# Proceedings of Societies

**Augusta County Medical Association.**

The annual business and social session of this Association was held at Blue Ridge Terrace, near Afton, Va., on August 1st, with an attendance of thirty-five. Dr. H. T. Hawkins, Waynesboro, read his presidential address, the subject being "Some Problems in Industrial Works." A number of clinical cases were also reported. Two doctors were elected to membership and a couple of applications were received. Dr. R. S. Griffith, Waynesboro, and Dr. Frank M. Hanger, Staunton, both having practiced for over fifty years, were elected to honorary membership.

Officers elected for the ensuing year include: President, Dr. C. P. Obenschain, Staunton; vice-presidents, Drs. W. A. Murphy, C. W. Rodgers and Chalmers Wills, all of Staunton; treasurer, Dr. T. M. Parkins, Staunton; secretary, Dr. W. F. Hartman, R. F. D., Staunton (the last two re-elected). Dr. H. T. Hawkins was elected a trustee, and Dr. C. P. Obenschain delegate to the annual meeting of the State Society. The next meeting will be on the fourth Wednesday in November.

**The Mid-Tidewater Medical Society**

Held its regular quarterly meeting at Gloucester C. H., Va., on July 24th, at the home of Dr. H. A. Tabb, with an attendance of twenty-four members and guests. The president, Dr. Robert Hoskins, Mathews, presided. Papers were presented by Drs. Lawrence T. Price, Reuben F. Simms, and F. S. Johns, all of Richmond, and these were freely discussed by visitors and members. Other visitors were

Drs. D. G. Chapman, A. I. Dodson and Dean Cole, of Richmond, and Dr. Wright Clarkson, of Petersburg. Members present were Drs. E. C. Cobb, R. D. Bates, J. M. Gouldin, E. L. W. Ferry, Hawes Campbell, Robt. Hoskins, W. E. Croxton, Malcolm H. Harris, A. Warner Lewis, Jas. D. Clements, H. F. Hoskins, Harry A. Tabb, J. R. Parker, W. Percy Jones and James W. Smith, and two Gloucester pharmacists.

The Society elected its vice-presidents as delegates to the meeting of the State Society in Alexandria in October, they to name their alternates if needed. Following the meeting, the Gloucester doctors entertained the visitors and members at a delightful luncheon in Dr. Tabb's home. The next meeting will be on the fourth Tuesday in October at Millers Tavern.

# News Notes

**Come Meet With Us—**

PLACE—Alexandria, Virginia.

TIME—October 9, 10 and 11, 1934.

OCCASION—Sixty-fifth annual meeting of the Medical Society of Virginia.

For the first time in over fifty years, our Society is meeting in Alexandria, this Fall, and we want to do credit to the occasion by having a large turnout of members and visitors. The program promises papers on a number of interesting subjects, including one by Dr. Harvey B. Stone, prominent surgeon of Baltimore. The other guest, Edgar Sydenstricker, Director of Public Health Activities, Milbank Memorial Fund, will be one of the speakers in the symposium on Medical Economics. Clinics are also being planned and these are always an attraction.

In other departments of this issue of the MONTHLY will be found the Preliminary Program and an interesting statement as to points of interest in and around Alexandria. There will be excellent scientific and commercial exhibits and matters of importance are to be discussed in the House of Delegates.

For the golfers, there will be the usual tournament. This has been scheduled for Tuesday, October 9th, at 1:30 P. M., at Belle Haven Country Club. Those who expect to participate are asked to bring their State or Club handicaps with them.

Wives and daughters of doctors are given a most cordial invitation to attend, whether or not members of the Woman's Auxiliary.

The George Mason is hotel headquarters and those who count on attending should make reservations promptly.

There is much to be gotten in the way of good fellowship as well as in a scientific way at these meetings, and we urge members to attend.

**Interesting Meeting in November.**

The International Assembly of the Inter-State Post-Graduate Medical Association of North America will be held in the Public Auditorium, Philadelphia, Pa., November 5-9, 1934. Many distinguished teachers and clinicians will appear on the program. A major list of the names of the contributors to the program, with other information, appears on advertising page 19 of this journal.

All members of the Medical Society of Virginia are cordially invited to attend. Registration fee of $5.00 admits all members of the profession in good standing.

**Dr. Harry G. Hudnall,**

Class of '31, University of Virginia, has completed his fellowship at the Cleveland Clinic and is now located for practice in Covington, Va. He is associated with his father, Dr. B. Ryland Hudnall.

**Dr. Caleb S. Stone, Jr.,**

For a time located at Farmville, Va., recently finished a research fellowship in surgery at the University of Virginia and has moved to Santa Barbara, Calif., where he is engaged in the practice of surgery.

**Dr. Clarence E. Arnette,**

An alumnus of the Medical College of Virginia, class of '33, upon completion of his internship at Garfield Memorial Hospital, Washington, D. C., in June, located in Alexandria, Va., with offices in Barrett Building. He is engaged in general practice.

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**Married.**

Dr. Booker Lee and Miss Nellie Estelle Lindsay, both of Pulaski, Va., June 20th.

Dr. Charles Lorraine Cabell, class of '34, University of Virginia, and Miss Elizabeth deVega Danford, University, Va., July 28th. They are making their home in Richmond where Dr. Cabell is interning at Memorial Hospital.

Mr. William Benjamin Hubbard, Covington, Va., and Miss Mary Lee Carter, daughter of Dr. and Mrs. B. L. Carter, of Blue Spring Run, Va., July 16th.

Dr. R. Angus Nichols, Sr., and Miss May Carmichael, both of Richmond, Va., August 15th.

**Dr. R. N. Hillsman, Jr.,**

Class of '33, University of Virginia, Department of Medicine, having completed one year rotating surgical internship at the University Hospital, has located at Amherst, Va., where he is engaged in general practice.

**Dr. Jethro M. Hurt**

Has located in Blackstone, Va., for the general practice of medicine. He is an alumnus of the University of Virginia, class of '33, and recently completed an internship at St. Elizabeth's Hospital, Richmond, Va.

**Dr. W. W. Cleere,**

Hopewell, Va., was elected chairman of the board of directors of the Prince George County Cotton Control Association, organized at Hopewell, the middle of August.

**Dr. Joseph F. Phillips,**

Of the class of '33, Medical College of Virginia, who interned at St. Joseph's Hospital, Pittsburgh, Pa., last year, has located for general practice in Newport News, Va., with offices at 2501 Chestnut Avenue.

**Dr. A. I. Dodson,**

Richmond, Va., by invitation, addressed the Third District Medical Society of North Carolina, at their meeting in Southport, on July 27th. His subject was The Management of Prostatic Obstructions.

**The American Congress of Physical Therapy**

Is holding its annual session at the Bellevue Stratford, in Philadelphia, Pa., September 10th-13th. Dr. Albert F. Tyler, Omaha, Nebr., is president, and Dr. Nathan H. Polmer, New Orleans, secretary.

**Dr. William B. Carpenter,**

Recently at Grace Hospital, Richmond, Va., has located for general practice at New Hope, Va. He is a member of the class of '33, University of Virginia.

**Dr. F. C. Warnshuis,**

For a number of years secretary of the Michigan State Medical Society, is retiring from this office on September 15th and is leaving Michigan to assume the duties of Secretary-Treasurer of the California Medical Association on October 1st. To those who attend meetings of the American Medical Association, Dr. Warnshuis is well known as Speaker of the House of Delegates of that organization.

**Dr. Norman E. Tylar,**

Formerly of Petersburg, Va., and an alumnus of Georgetown University Medical School, has located in Hopewell, Va., where he is assistant to Dr. D. Lane Elder, with offices in Elder Building. He succeeds Dr. Albert T. Brickhouse, who has been made physician for the CCC Camp at Cape Henry, Va.

**The Southern Medical Association,**

According to custom, will hold its annual meeting in November. San Antonio, Texas, the convention city, extends a cordial invitation for all who can to attend. Every Southern physician who is a member of his State and county medical societies is eligible to membership. The dates are November 13th-16th, and this year's president is Dr. Hugh Leslie Moore, of Dallas, Texas. There will be a post-convention trip to Mexico and information about this may be obtained from the secretary-manager of the Association, Mr. C. P. Loranz, Empire Building, Birmingham, Ala.

**Dr. J. L. DeCormis,**

Accomac, Va., has been re-appointed a member of the Accomac County School Electoral Board for the appointment of school trustees.

**Dr. Herbert C. Jones,**

Petersburg, Va., has been appointed assistant city coroner of Petersburg. Dr. E. L. McGill is coroner.

**Dr. Zack P. Mitchell,**

Weldon, N. C., was recently elected health officer of Vance County, North Carolina. Dr. Mitchell is an alumnus of the Medical College of Virginia.

### Dr. Gibson C. Engel,

Surgeon to the Lankenau Hospital, Philadelphia, was guest speaker at the regular meeting of the Medical Society of Northern Virginia, August 14th. The meeting was held at White Post, Va., with Dr. C. O. Dearmont of that place as host.

### Dr. James T. Jackson,

Recently of Ashburn, Va., has become chief resident in surgery at Garfield Memorial Hospital, Washington, D. C., having entered upon these duties on July 1st.

### The Medico-Military Symposium

For Medical Department Reserve Officers of the Army and Navy will be held for the fifth year at the Mayo Clinic, Rochester, Minn., October 7th-20th, inclusive. As in former courses, the morning hours will be devoted to attending clinics on subjects selected by the student officers, and the afternoon and evening hours will be given over to work in Medico-Military subjects. The general motif of the Medico-Military part of the Symposium will be "Public Health and Its Relation to National Defense." A splendid program of a thoroughly practical nature has been compiled and the speakers selected for their ability to prevent authoritatively the subjects assigned. Those who attend the course for full or part-time will receive credit for the hours spent in training.

Detailed information should be obtained from the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska, or the District Medical Officer, Ninth Naval District, Great Lakes, Ill.

### Dr. Hight C. Warwick

Has located in Greensboro, N. C., where he will be engaged in general practice in association with Drs. C. M. Gilmore and P. A. Shelburne. All of these doctors are alumni of the Medical College of Virginia.

### Dr. C. B. White,

Halifax, Va., has been appointed part-time health officer for Halifax County, Va., and will continue his private practice also. He succeeds Dr. S. D. Gardner, resigned, who is now first lieutenant and camp surgeon at a CCC Camp at Wilderness, Va. Dr. Gardner has been health officer in Halifax County for the past two years.

### Dr. Carroll B. Robertson,

Who interned at St. Vincent's Hospital, Norfolk, Va., after graduating from the Medical College of Virginia in 1933, has located in Jackson, N. C., where he is engaged in general practice.

### List of New Books in the Library of the Medical College of Virginia.

The following new books in the Library of the Medical College of Virginia are available to our members, return postage being the only cost:

Allen, Hervey—Anthony Adverse.
A. M. A.—Primer on Fractures. 3rd ed. Annual Review of Biochemistry (1934).
Barclay, A. E.—The Digestive Tract.
Bauer, W. W.—Contagious Diseases.
Becker, E. R.—Coccidia and Coccidiosis of Domesticated, Game and Laboratory Animals and of Man.
Brett, W. R.—Short History of Some Common Diseases.
Buck, Pearl—Good Earth.
Burr, Anna Robeson—Weir Mitchell, His Life and Letters.
Celli Angelo—History of Malaria in the Roman Campagna.
Cobb, Irvin—Irvin Cobb At His Best.
Cole & Bigelow—A Manual of Thesis Writing.
De Vries, W. M.—Atlas of Selected Cases of Pathological Anatomy.
Delmege, J. A.—Towards National Health.
Dodds, G. S.—Essentials of Human Embryology.
Doyle, A. Conan—Complete Sherlock Holmes.
Durant, Will—Story of Philosophy.
Feinberg, Samuel M.—Allergy in General Practice.
Filipiev, I. N.—The Classification of the Free-living Nematodes and Their Relation to the Parasitic Nematodes.
Fishbein, Morris—Shattering Health Superstitions.
Fraenkel & Thauer—Strophanthin Therapy.
Franklin, K. J.—A Short History of Physiology.
Gadow, H. F.—The Evolution of the Vertebral Column.
Glasser, Otto, ed.—The Science of Radiology.
Gleason, Edw. B.—Manual of Diseases of the Nose, Throat, and Ear.
Grenfell, W. T.—Labrador Doctor.
Haggard, Howard W.—Mystery, Magic and Medicine.
Hemingway, Ernest—Farewell to Arms.
Ingleson, H.—The Action of Water on Lead, etc.
Joslin, E. P.—Diabetic Manual.
Kovacs, Richard—Nature, M. D.
Lewis, Sir Thomas—Clinical Disorders of the Heart Beat.
Loebel, Josef—Medicine.
Medical Research Council—Special Report Series No. 188—Committee Upon the Physiology of Vision.
Mellanby, May—Diet and the Teeth.
Meyer & Gottlieb—Die Experimentelle Pharmakologie als Grundlage der Arzneibehandlung.
Munthe, Axel—Story of San Michele.
Ormsby, Oliver S.—Diseases of the Skin. 4th ed.

Osborne & Fishbein—Handbook of Therapy.
Parsonnet & Hyman—Applied Electrocardiography.
Peterson, H.—Huxley, Prophet of Science.
Putnam, Ruth—Mary Putnam Jacobi, Life and Letters.
Remarque, E. M.—All Quiet on the Western Front.
Rivera, Diego—Portrait of America.
Rogers, Will—Ether and Me, or Just Relax.
Rowe, Allan W.—Differential Diagnosis of Endocrine Disorders.
Seldes, George—Iron, Blood and Profit.
Sherrington, Charles—The Brain and Its Mechanism.
Stokes, J. H., et als.—Modern Clinical Syphilology (1934 ed.)
Pemberton & Osgood—The Medical and Orthopedic Management of Chronic Arthritis.
Vaughan, J. M.—The Anemias.
Wistar Institute Style Brief.
Wittels, Fritz—Sigmund Freud.
Wright, Samson—Applied Physiology. 5th ed.

**For Sale—**

Fischer Mobile Diatherm. Practically new. For rates, apply to "No. 408," care this journal. (*Adv.*)

**For Sale—**

Four year old General Electric Mobile X-ray Unit. In splendid condition. Reason for selling, my work demands a heavier capacity machine. Available September 25th. Address "No. 441," care this journal. (*Adv.*)

**For Sale or Rent—**

Country practice, residence and fifty-eight acres of land in Piedmont Virginia. Ideal location. Nearest doctor ten miles distant, others eighteen miles. Good roads, churches and high school convenient. Failing health reason for selling. Interested parties apply to "XYZ," care this journal. (*Adv.*)

**For Sale or Lease—**

Modern residence, corner property and three office rooms, all partly furnished if desired. City conveniences. Located on west side of the Lee National Highway, with a modern hospital nine miles south, and thirty-five miles north of Staunton, Va., and fifty-eight miles south of Winchester, Va. Rich thickly settled community with good roads, schools and churches. Has been a doctor's location for over sixty years. Reason for selling, poor health. Write No. 447, care this journal. (*Adv.*)

# Obituary Record

**Dr. Francis Thomas Ridley,**

Well-known physician of Bluefield, W. Va., died on July 20th, death being due to heart disease from which he had suffered for several months. Dr. Ridley was a native of Portsmouth, Va., and about fifty-two years of age. He received his medical education at the University of Virginia, graduating from that institution in 1903. He practiced for a time in the western part of Virginia before locating at Bluefield. Though a member of his State medical association, he had also continued his membership in the Medical Society of Virginia. His wife survives him.

**Dr. Rudolf Bolling Teusler,**

Formerly of Richmond, Va., but for more than thirty years a medical missionary in Tokyo, Japan, where he founded and directed St. Luke's International Hospital, died there on August the 10th, his death being due to a heart affliction. Dr. Teusler was fifty-eight years of age and graduated from the Medical College of Virginia in 1894. He practiced in Richmond until 1900 at which time he went to Tokyo. Dr. Teusler had been honored by a number of organizations and was recently recipient of the honorary degree of Doctor of Science from the Medical College of Virginia. His wife, also a former Richmonder, and several children survive him.

**Dr. Archibald E. Baker,**

Prominent surgeon of Charleston, S. C., and founder and surgeon-in-chief of Baker Sanatorium in that city, died suddenly on July 31st, at his summer home on Folly Island, S. C. He was seventy-one years of age and a graduate of the Medical College of the State of South Carolina in the class of '89. He was a former president and interested member of the Tri-State Medical Association of Virginia and the Carolinas.

**Dr. William A. Johnston,**

Roanoke, Va., died at his home in that city on May 30th, after a long illness. He was seventy-one years of age and had graduated in medicine from the College of Physicians and Surgeons, Baltimore, in 1881.

**Dr. Warren Brown Hill,**

Rectory, Va., aged seventy-two years, died May 13th, as the result of cancer. He was a graduate of the Baltimore University School of Medicine in 1892.